IES Institute of Education Sciences

APPENDIXES
January 2021

Regional Educational Laboratory Central
At Marzano Research

How Nebraska Teachers Use and Perceive Summative, Interim, and Formative Data

See https://go.usa.gov/xAXnM for the full report.

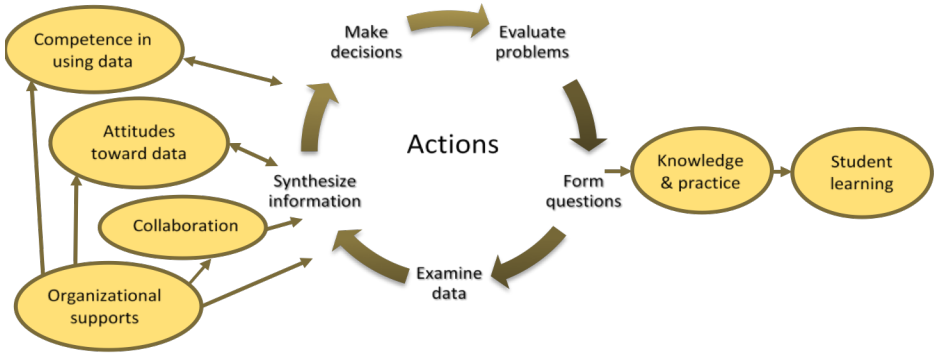
Appendix A. About the study

This appendix presents additional information about the study topic: teachers' data use. It begins with a description of the conceptual framework and supporting literature for the scales in the Teacher Data Use Survey (TDUS; Wayman et al., 2016), which the Nebraska Department of Education (NDE) administered to teachers and principals in March 2019. It then presents literature on teacher and school characteristics that were of interest to NDE as possible factors associated with teachers' data use.

The Teacher Data Use Survey conceptual framework and supporting literature

This study employed the TDUS as a measure of teachers' use of summative, interim, and formative assessment data. The TDUS is supported by a conceptual framework with relevant literature (Wayman et al., 2016). The conceptual framework presents the actions that teachers take with data as critical to improving their knowledge and practice and, in turn, students' learning (figure A1). This framework also articulates that these actions are influenced by teachers' perceived competence in using data, their attitudes toward data, organizational supports, and collaboration (Goertz et al., 2009; Supovitz, 2010). Accordingly, the TDUS consists of five scales to measure the construct of teachers' data use: Actions with Data, Competence in Using Data, Attitudes toward Data, Organizational Supports, and Collaboration.

Figure A1. Teacher Data Use Survey conceptual framework



Source: Wayman et al., 2016.

The study focused on teachers' use of data, their perceived competence in using data, their attitudes toward data, and their perceptions of organizational supports for using data, as measured by the corresponding scales of the TDUS. Teacher instructional knowledge and practice and student learning—the other components of the conceptual framework—are broader issues that encompass more than just data use and were therefore beyond the scope of this study. Accordingly, the TDUS measures only data use and not those two components. In addition, the TDUS was not administered with the Collaboration scale because NDE leaders did not deem it a priority and were concerned about survey burden and length. By omitting the Collaboration scale, NDE leaders reduced the survey length by 16 items.

Actions with Data scale. In the TDUS conceptual framework, teachers are viewed as engaging in a variety of actions that help them draw meaning from data. Most of the actions that teachers take when using data involve their classrooms. For example, teachers might use data to identify students who need further assistance, select instructional materials, or help students understand their learning (Hamilton et al., 2009; Supovitz, 2012). Teachers commonly use data to plan which materials to use in classes, group students, tailor individual instruction, identify additional instructional supports, or simply decide what to teach (Datnow et al., 2007; Lachat & Smith, 2005; Supovitz, 2012). Teachers also use data outside the classroom. For instance, teachers might use data to facilitate conversations with students, parents, instructional support staff, or other teachers (Datnow et al., 2007; Hamilton et al., 2009).

Additionally, in the TDUS conceptual framework, teachers' processes as they engage with data are guided by a cycle of inquiry. Data are examined in response to problems and questions, and the resulting meaning informs decisions (Mandinach & Gummer, 2016a, 2016b). These actions are the driving force behind changes in knowledge and practice; that is, teachers are seen as gaining new knowledge through the effective use of data and using that knowledge to improve their teaching practice. Teachers use data effectively when they align the appropriate type of data to the kinds of decisions they need to make, such as using formative data to gather ongoing, diagnostic information to assess student learning that will inform instructional strategies and using summative data to periodically inform student progress toward end-of-year benchmarks and grade-level goals (Horn et al., 2015; Marsh & Farrell, 2015; Pellegrino et al., 2016). Increased instructional knowledge and improved instructional practice thus are expected to translate into improved student learning (Boudett et al., 2005; Lai et al., 2009; Mandinach & Gummer, 2016a, 2016b; Slavin et al., 2013). However, outcomes might vary by content area, such as math versus reading, and student ability, such low- versus high-achieving students (Carlson et al., 2011; Konstantopoulos et al., 2013). In addition, teachers' perceived competence with data, their attitudes toward data, and the organizational supports available to them in using data could influence their data use.

The Actions with Data scale in the TDUS measures specific actions teachers take with summative, interim, and formative assessment data. There are three blocks of the same items that differ only in their reference to using summative, interim, or formative data. The items within each block prompt respondents to indicate their

frequency of using summative, interim, or formative data to take a variety of actions such as tailoring instruction to individual students' needs, discussing data with students or parents, and meeting with other teachers about the data. On the principal version of the TDUS, principals indicate how often their teachers take these actions with data. (See appendix E for the teacher and principal versions of the TDUS.)

Competence in Using Data scale. Educators must be competent in using data in order to engage in effective actions with data (Goertz et al., 2009; Mandinach & Gummer, 2013). Without a certain level of competence, educators would not be able to engage effectively in examining data or determining information as described in the cycle of inquiry (Mandinach & Gummer, 2016a, 2016b). Competence is reciprocally related to teachers' data use; that is, teachers must be competent to use data effectively, and the more they use data effectively, the more their competence in using data increases. Educators report that the more they engage in effective data use, the more data skills they learn (Lachat & Smith, 2005). To this end, organizational supports are particularly important (Hamilton et al., 2009). A variety of such supports have been associated with gaining competence, including data-related professional learning (Jimerson & Wayman, 2015; Mandinach & Jimerson, 2016; Wilkerson & Johnson, 2017), data coaches (Marsh et al., 2010), and effective principal leadership (Copland, 2003; Hamilton et al., 2009).

The Competence in Using Data scale in the TDUS includes items that prompt teachers to consider whether they are proficient in various aspects of data use. Example items include "I am good at using data to diagnose student learning needs" and "I am good at adjusting instruction based on data." The responses provide insight into how teachers perceive their competence in using data relative to the actions they take with data. On the principal version of the TDUS, these items are framed from a principal's perspective: "My teachers are good at using data to diagnose student learning needs" and "My teachers are good at adjusting instruction based on data."

Attitudes toward Data scale. Teachers' data use could be influenced by their attitudes toward, as well as their competence in, using data. Teachers' attitudes about whether and how data are effectively used to support instruction can influence the specific actions they take with data and the depth to which they will engage in these actions (Goertz et al., 2009; Supovitz, 2010). In contexts with exemplary data use, teachers have commonly had positive attitudes about how data can improve pedagogy and support instructional practice (Datnow et al., 2007; Lachat & Smith, 2005). Conversely, in contexts in which data use was difficult, teachers have been skeptical of the value of data to their practice (Ingram et al., 2004; Valli & Buese, 2007).

The Attitudes toward Data scale in the TDUS includes two subscales: Attitudes toward Data and Data's Effectiveness for Pedagogy. The Attitudes toward Data subscale includes items such as "I think it is important to use data to inform education practice" and "I like to use data." The Data's Effectiveness for Pedagogy subscale includes items such as "Data help teachers plan instruction" and "Students benefit when teacher instruction is informed by data." Both the principal and teacher versions of the TDUS have the same phrasing for these items.

Organizational Supports scale. Teachers' data use could be influenced by a variety of organizational supports implemented at the school, district, regional, or state level (Datnow et al., 2007; Supovitz, 2010; Wayman et al., 2012). Organizational supports may include computer systems, professional learning, and principal leadership.

Computer systems enable teachers to access data. Teachers are more likely to use systems that closely align with their own views of what data are and how data support learning (Cho & Wayman, 2014). Accordingly, research has reported widespread use of a variety of data in effective systems (Lachat & Smith, 2005), but limited use of data in systems not perceived as effective (Wayman et al., 2017).

Organizational supports also include the professional learning that teachers receive to help them improve their data use. Data-related professional learning can be an effective support when it is timely, connected to other professional learning, and aligned to teachers' work (Jimerson & Wayman, 2015; Mandinach & Jackson, 2012; Mandinach & Jimerson, 2016; Wilkerson & Johnson, 2017). However, research on the relationship between organizational supports and teachers' data use, teachers' instructional practices, and student achievement is

mixed. Some research has shown that teachers improve their data-use practices when they receive school- or district-level support for training on using data (Armstrong & Anthes, 2001; Schildkamp & Kuiper, 2010). Other research has shown no impacts (Gleason et al., 2019).

Principal leadership is also touted as an important support for teachers' data use (Copland, 2003; Knapp et al., 2006; Sutherland, 2004; Wayman et al., 2012). Principals are often responsible for facilitating organizational supports such as those mentioned above. They can employ a variety of other strategies to support teachers' data use, such as protecting scheduled time for teachers to use data; enabling frequent discussions about data between teachers and students, teachers and parents, and teachers and school staff; and periodically meeting with collaborative teams (Datnow et al., 2007; Hamilton et al., 2009; Knapp et al., 2006, Wayman et al., 2012).

The Organizational Supports scale in the TDUS includes three subscales: Computer Data Systems, Support for Data Use, and Principal Leadership. The Computer Data Systems subscale includes items about characteristics of respondents' data systems, such as "I have the proper technology to efficiently examine data." The Support for Data Use subscale includes items about support structures for teachers, such as "I am adequately supported in the effective use of data." Finally, the Principal Leadership subscale prompts teachers to respond about actions that principals and assistant principals take regarding data. For example, one item is "My principal or assistant principal(s) encourages data use as a tool to support effective teaching." On the principal version of the TDUS, these items are framed from a principal's perspective: "My teachers are adequately supported in the effective use of data" and "I encourage data use as a tool to support effective teaching."

Supporting literature for other factors of interest

In addition to examining the actions teachers take with data, their perceived competence in using data, their attitudes toward data, and their perceptions of organizational supports for using data, this study examined how other factors of interest to NDE were associated with teachers' data use. These factors included teacher characteristics such as highest degree earned, years of experience in education, and teaching assignment in a core subject, as well as school characteristics such as Nebraska's school accountability classification.

Teacher characteristics and data use. Teachers' education level could account for differences in their own data use. Teachers with a more-advanced degree could have received more preparation related to data, such as in what the different types of data are, how to collect and interpret data, and how to use data to inform instructional decisions (van Geel et al., 2017). Teachers with a more-advanced degree and subsequent understanding of data use could value data use and professional support for using data more than teachers with a bachelor's degree do (Moore & Shaw, 2017). However, education programs do not guarantee a foundation in using data because teacher preparation programs tend to focus more on assessment literacy than on data literacy (Mandinach et al., 2015). The limited research on the relationship between education degree and data use (Moore & Shaw, 2017) has found mixed results. One study found no relationship between teachers' degree level and their collaboration when reviewing assessments (Ronfeldt et al., 2015). Another study found that teachers enrolled in postsecondary degree programs that included instruction on data use were more likely to use data in their classrooms (Reeves et al., 2016).

Teachers' years of experience in education could also be an important characteristic when examining teachers' data use because more experienced teachers might not have an education background in data use, which is a newer focus in the field (Reeves, 2017). Although the relationship between years of experience in education and data use has not been studied to a great extent, some research has shown that less experience in education is related to higher data use (Reeves, 2017; Yoon, 2016). This finding could be a result of teacher preparation programs increasingly integrating data use and data literacy into their curricula to equip new teachers with the knowledge and skills necessary to use data to inform instructional decisionmaking (Mandinach & Gummer, 2016b). Newer teachers might report more frequent data use or positive attitudes toward data than teachers with

more years in education do. However, other studies have found that teachers with more experience (for example, more than 15 years) engage in data use more often than teachers with less experience do (Means et al., 2007; Ronfeldt et al., 2015). Thus, findings from extant research remain mixed.

Other teacher characteristics might also be factors in understanding teacher data use practices. One study showed a notable difference between special education teachers and classroom teachers: special education teachers used data more often than their counterparts (Reeves, 2017). Additionally, findings have shown that teachers' data use can vary by content area and subject taught (Means et al., 2007; Zhang & Burry-Stock, 2003). The variations in existing research on these topic points to why NDE is interested in examining whether teachers' data use varies based on teacher characteristics.

School characteristics and data use. The study team did not find existing research on the relationship between school accountability classifications—such as NDE's excellent, great, good, and needs improvement classifications, which are based on school-level performance data—and teacher data use.[1] Research on teachers' data use in high- versus low-performing schools suggests that teachers in low-performing schools need more professional support in using data (Gallagher et al., 2008). Low-performing schools might focus data use on improving achievement for targeted student groups, whereas high-performing schools might have the support and resources for using data to improve achievement for all students (Spillane et al., 2004). Research also suggests that low-performing schools focus data use on monitoring student progress toward benchmarks in math and reading or specifically on assisting students at the threshold of passing an assessment (those students most likely to affect a school's accountability rating), in contrast to high-performing schools, which focus data use and improvement efforts on all grade levels and content areas (Booher-Jennings, 2005; Spillane et al., 2004).

Previous research has suggested that teachers' data use might vary by school level (elementary, middle, or high).[2] For example, one study found that 81 percent of middle and high school science teachers and 77 percent of middle and high school English language arts teachers were more likely to use student data systems to keep parents informed of students' progress, compared with 63 percent of elementary school teachers (Gallagher et al., 2008). The same study also found that 47 percent of elementary school teachers used student data systems to inform instructional pacing, compared with only 31 percent of middle and high school social studies teachers. Another study found that elementary and middle school teachers reported using data to inform their instruction more often than high school teachers did and that elementary and middle school teachers' attitudes toward data were more positive than those of high school teachers (Moore & Shaw, 2017).

No studies have explicitly examined the relationship between teachers' data use and Title I status, in which schools receive funding to provide additional support to students from low-income households. According to a national study of Title I assistance programs, 40 percent of schools used Title I staff to provide schoolwide data and analytic

[1] This process starts with assigning a school an initial classification level (from 1 to 4) by comparing the percentage of students who score on track or higher on the Nebraska Student-Centered Assessment System (NSCAS) Summative math and English language arts statewide assessments to established cutscores. The following steps involve adjusting the classification level based on several weighted indicators of school performance (for example, graduation rates, the trend of NSCAS Summative math and English language arts assessment scores over the prior three years, the percentage of individual assessments scores that showed an increase from the previous year) into one score for each school. Each score is compared with the cutscores to adjust the classification level up or down. Once complete, each school is then assigned a raw classification score. This raw classification is considered the final classification level unless a school whose level is below *excellent* chooses to submit additional documents for review (for example, policies, procedures, and practices that might impact students' achievement and their outcomes). Following this review, each school receives an additional response score that ranges from 0 to 120 points. If the response score is in the top percentile compared with schools in the same raw classification level, a school's final classification level can be raised by one level (Nebraska Department of Education, 2019).

[2] School level (elementary, middle, and high) was used in this study for sampling purposes, in the nonresponse bias analyses, and to account for differences in the study's analytical models.

support (Le Floch et al., 2018), perhaps creating a different context for data use in schools receiving Title I funding from that in schools not receiving such funding.[3]

References

Armstrong, J., & Anthes, K. (2001). How data can help. *American School Board Journal, 188*(11), 38–41. https://eric.ed.gov/?id=EJ634850.

Booher-Jennings, J. (2005). Below the bubble: "Education triage" and the Texas accountability system. *American Educational Research Journal, 42*(2), 231–268. https://eric.ed.gov/?id=EJ737122.

Boudett, K. P., Murnane, R. J., City, E., & Moody, L. (2005). Teaching educators how to use student assessment data to improve instruction. *Phi Delta Kappan*, *86*(9), 700–706. https://eric.ed.gov/?id=EJ712938.

Carlson, D., Borman, G. D., & Robinson, M. (2011). A multistate district-level cluster randomized trial of the impact of data-driven reform on reading and mathematics achievement. *Educational Evaluation and Policy Analysis, 33*(3), 378–398. https://eric.ed.gov/?id=EJ935253.

Cho, V., & Wayman, J. C. (2014). Districts' efforts for data use and computer data systems: The role of sensemaking in system use and implementation. *Teachers College Record, 116*(2), 1–45. https://eric.ed.gov/?id=EJ1020227.

Copland, M. A. (2003). Leadership of inquiry: Building and sustaining capacity for school improvement. *Educational Evaluation and Policy Analysis*, *25*(4), 375–395. https://eric.ed.gov/?id=EJ782423.

Datnow, A., Park, V., & Wohlstetter, P. (2007). *Achieving with data: How high-performing school systems use data to improve instruction for elementary students*. University of Southern California, Rossier School of Education, Center on Educational Governance. http://people.uncw.edu/kozloffm/AchievingWithData.pdf.

Gallagher, L., Means, B., & Padilla, C. (2008). *Teachers' use of student data systems to improve instruction: 2005 to 2007.* U.S. Department of Education, Office of Planning, Evaluation and Policy Development. https://eric.ed.gov/?id=ED504214.

Gleason, P., Crissey, S., Chojnacki, G., Zukiewicz, M., Silva, T., Costelloe, S., & O'Reilly, F. (2019). *Evaluation of support for using student data to inform teachers' instruction* (NCEE No. 2019-4008). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://eric.ed.gov/?id=ED598641.

Goertz, M. E., Oláh, L. N., & Riggan, M. (2009). *Can interim assessments be used for instructional change?* (CPRE Policy Brief No. RB-51). Consortium for Policy Research in Education. https://eric.ed.gov/?id=ED536829.

Hamilton, L., Halverson, R., Jackson, S. S., Mandinach, E., Supovitz, J. A., & Wayman, J. C. (2009). *Using student achievement data to support instructional decision making* (NCEE No. 2009-4067). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://eric.ed.gov/?id=ED506645.

Horn, I. S., Kane, B. D., & Wilson, J. (2015). Making sense of student performance data: Data use logics and mathematics teachers' learning opportunities. *American Educational Research Journal*, *52*(2), 208–242. https://eric.ed.gov/?id=EJ1056332.

Ingram, D., Seashore Louis, K., & Schroeder, R. G. (2004). Accountability policies and teacher decision making: Barriers to the use of data to improve practice. *Teachers College Record, 106*(6), 1258–1287. https://eric.ed.gov/?id=EJ687665.

Jimerson, J. B., & Wayman, J. C. (2015). Professional learning for using data: Examining teacher needs and supports. *Teachers College Record, 117*(4), 1–20. https://eric.ed.gov/?id=EJ1056726.

Knapp, M. S., Swinnerton, J. A., Copland, M. A., & Monpas-Huber, J. (2006). *Data-informed leadership in education*. University of Washington, Center for the Study of Teaching and Policy. https://eric.ed.gov/?id=ED494198.

[3] Title I status was used in the nonresponse bias analyses and as a covariate in the analytical models to account for any differences across schools.

Konstantopoulos, S., Miller, S. R., & van der Ploeg, A. (2013). The impact of Indiana's system of interim assessments on mathematics and reading achievement. *Educational Evaluation and Policy Analysis, 35*(4), 481–499.

Lachat, M. A., & Smith, S. (2005). Practices that support data use in urban high schools. *Journal of Education for Students Placed at Risk, 10*(3), 333–349. https://eric.ed.gov/?id=EJ684194.

Lai, M. K., McNaughton, S., Amituanai-Toloa, M., Turner, R., & Hsiao, S. (2009). Sustained acceleration of reading comprehension: The New Zealand experience. *Reading Research Quarterly, 44*(1), 30–56. https://eric.ed.gov/?id=EJ824070.

Le Floch, K. C., Levin, J., Atchison, D., Tanenbaum, C., Hurlburt, S., Manship, K., & Stullich, S. (2018). *Study of Title I schoolwide and targeted assistance programs: Final report*. U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service. https://eric.ed.gov/?id=ED591033.

Mandinach, E. B., Friedman, J. M., & Gummer, E. (2015). How can schools of education help to build educators' capacity to use data? A systemic view of the issue. *Teacher College Record, 117*(4), 1–50. https://eric.ed.gov/?id=EJ1056728.

Mandinach, E. B., & Gummer, E. S. (2013). A systemic view of implementing data literacy in educator preparation. *Educational Researcher, 42*(1), 30–37. https://eric.ed.gov/?id=EJ995864.

Mandinach, E. B., & Gummer, E. S. (2016a). *Data literacy for educators: Making it count in teacher preparation and practice*. Teachers College Press. https://eric.ed.gov/?id=ED572674.

Mandinach, E. B., & Gummer, E. S. (2016b). What does it mean for teachers to be data literate: Laying out the skills, knowledge, and dispositions. *Teaching and Teacher Education*, *60*(1), 366–376.

Mandinach, E. B., & Jackson, S. S. (2012). *Transforming teaching and learning through data-driven decision making.* Corwin.

Mandinach, E. B., & Jimerson, J. B. (2016). Teachers learning how to use data: A synthesis of the issues and what is known. *Teaching and Teacher Education, 60*(1), 452–457.

Marsh, J. A., & Farrell, C. C. (2015). How leaders can support teachers with data-driven decision making: A framework for understanding capacity building. *Educational Management Administration & Leadership, 43*(2), 269–289. https://eric.ed.gov/?id=EJ1053143.

Marsh, J. A., McCombs, J. S., & Martorell, F. (2010). How instructional coaches support data-driven decision making: Policy implementation and effects in Florida middle schools. *Educational Policy, 24*(6), 872–907. https://eric.ed.gov/?id=EJ910624.

Means, B., Gallagher, L., & Padilla, C. (2007). *Teachers' use of student data management systems to improve instruction*. U.S. Department of Education, Office of Planning, Evaluation and Policy Development. https://eric.ed.gov/?id=ED501547.

Moore, R., & Shaw, T. (2017). *Teachers' use of data: An executive summary*. ACT. http://www.act.org/content/dam/act/unsecured/documents/R1661-teachers-use-of-data-2017-12.pdf.

Nebraska Department of Education. (2019). *DRAFT AQuESTT Classification Rules – Version 2.1.* https://aquestt.com/wp-content/uploads/2019/09/AQuESTT-Classification-Rules-v2.1.pdf.

Pellegrino, J. W., DiBello, L. V., & Goldman, S. R. (2016). A framework for conceptualizing and evaluating the validity of instructionally relevant assessments. *Educational Psychologist, 51*(1), 59–81. https://eric.ed.gov/?id=EJ1097531.

Reeves, T. (2017). School level and other differences in Illinois teachers' use of data to inform instruction. *Mid-Western Educational Researcher, 29*(4), 332–354. https://eric.ed.gov/?id=EJ1165680.

Reeves, T. D., Summers, K. H., & Grove, E. (2016). Examining the landscape of teacher learning for data use: The case of Illinois. *Cogent Education, 3*(1), 1–21. https://eric.ed.gov/?id=EJ1138387.

Ronfeldt, M., Owens Farmer, S., McQueen, K., & Grissom, J. A. (2015). Teacher collaboration in instructional teams and student achievement. *American Educational Research Journal, 52*(3), 475–514. https://eric.ed.gov/?id=EJ1063553.

Schildkamp, K., & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*(3*)*, 482–496. https://eric.ed.gov/?id=EJ872951.

Slavin, R. E., Cheung, A., Holmes, G., Madden, N. A., & Chamberlain, A. (2013). Effects of a data-driven reform model on state assessment outcomes. *American Educational Research Journal, 50*(2), 371–396. https://eric.ed.gov/?id=EJ1005740.

Spillane, J. P., Halverson, R., & Diamond, J. B. (2004). Towards a theory of leadership practice: A distributed perspective. *Journal of Curriculum Studies, 36*(1), 3–34. https://eric.ed.gov/?id=EJ695066.

Supovitz, J. (2010). Knowledge-based organizational learning for instructional improvement. In A. Hargreaves, A. Lieberman, M. Fullan, & D. Hopkins (Eds.), *Second international handbook of educational change* (pp. 707–723). Springer.

Supovitz, J. (2012). Getting at student understanding—The key to teachers' use of test data. *Teachers College Record, 114*(11), 1–29. https://eric.ed.gov/?id=EJ1001991.

Sutherland, S. (2004). Creating a culture of data use for continuous improvement: A case study of an Edison Project school. *American Journal of Evaluation, 25*(3), 277–293. https://eric.ed.gov/?id=EJ689244.

Valli, L., & Buese, D. (2007). The changing roles of teachers in an era of high-stakes accountability. *American Educational Research Journal, 44*(3), 519–558.

van Geel, M., Keuning, T., Visscher, A., & Fox, J.-P. (2017). Changes in educators' data literacy during a data-based decision making intervention. *Teaching and Teacher Education, 64*(1), 187–198.

Wayman, J. C., Jimerson, J. B., & Cho, V. (2012). Organizational considerations in establishing the Data-Informed District. *School Effectiveness and School Improvement, 23*(2), 159–178. https://eric.ed.gov/?id=EJ963089.

Wayman, J. C., Shaw, S., & Cho, V. (2017). Longitudinal effects of teacher use of a computer data system on student achievement. *AERA Open, 3*(1), 1–18. https://eric.ed.gov/?id=EJ1194175.

Wayman, J. C., Wilkerson, S. B., Cho, V., Mandinach, E. B., & Supovitz, J. A. (2016). *Guide to using the Teacher Data Use Survey* (REL 2017–166). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Appalachia. https://eric.ed.gov/?id=ED569169.

Wilkerson, S. B., & Johnson, M. (2017). Partners in a common cause: External evaluators team with practitioners to build data use practices. *The Learning Professional, 38*(2), 44–49. https://eric.ed.gov/?id=EJ1141717.

Yoon, S. Y. (2016). Principals' data-driven practice and its influences on teacher buy-in and student achievement in comprehensive school reform models. *Leadership and Policy in Schools, 15*(4), 500–523. https://eric.ed.gov/?id=EJ1111910.

Zhang, Z., & Burry-Stock, J. A. (2003). Classroom assessment practices and teachers' self-perceived assessment skills. *Applied Measurement in Education, 16*(4), 323–342. https://eric.ed.gov/?id=EJ761565.

Appendix B. Methods

This appendix provides additional details about the study sample, data, and methods used to conduct the study.

Selection of schools to include in the study sample

The Nebraska Department of Education (NDE) used a disproportionate sampling approach to identify schools to include in the study. Specifically, NDE constructed a sampling matrix defined by school level (elementary, middle, or high school) and Nebraska school accountability classification (excellent, great, good, needs improvement; table B1). The matrix included 12 groups of schools, one for each combination of school level and school accountability classification. NDE selected this approach because of the different summative assessments available for each school level and smaller population sizes for schools classified as excellent and needs improvement. NDE randomly selected 30 schools from each of the 12 groups of schools. After selecting the sample, NDE learned that seven of the selected schools had closed. Thus, the final sample for the study included 28–30 schools from each group, for a total of 353 schools.

Table B1. Study sampling matrix with the counts of schools in Nebraska and in the study sample, 2018/19

	Elementary schools		Middle schools		High schools		Total number of schools	
School accountability classification	Nebraska	Sample	Nebraska	Sample	Nebraska	Sample	Nebraska	Sample
Needs improvement	74	30	44	29	38	30	156	89
Good	196	30	105	30	88	30	389	90
Great	217	28	113	29	101	30	431	87
Excellent	58	30	39	28	37	29	134	87
Total number of schools	545	118	301	116	264	119	1,110	353

Source: Administrative data provided by Nebraska Department of Education, 2018/19.

Survey administration

Using an online survey platform, NDE administered the Teacher Data Use Survey (TDUS) in March 2019, during a time that did not conflict with other state survey campaigns. In the survey invitation NDE encouraged principals to allocate time for teachers to complete the survey. NDE sent three follow-up reminders to survey recipients. To address common challenges with self-reported data, NDE sent recipients a letter from the Nebraska commissioner of education stating that results would be used to plan ongoing professional learning support for data use and not for accountability purposes. NDE also sent an informed consent form that assured recipients that their identities and confidentiality would be protected. To promote memory recall and minimize the time between assessment use and survey completion, NDE administered the survey during the middle of the 2018/19 school year, when teachers would have had the opportunity to use data from all three forms of assessments (summative, interim, and formative) at least once. The survey questions prompted respondents to focus only on their use of these data during the 2018/19 school year.

Analytic sample characteristics and nonresponse bias analyses

The study team constructed an analytic sample for each survey version (teacher and principal) that included only respondents who had nonmissing data on all survey items needed to answer all of the study research questions. Data were considered nonmissing if respondents provided a valid answer or if their answer was logically missing. For example, if teachers indicated that a particular assessment was not available to them on survey question 1, they were not asked about their use of that assessment, resulting in logically missing data.

Total response rates for both survey versions fell below the 85 percent threshold specified in National Center for Education Evaluation and Regional Assistance (NCEE, 2019) guidance. For the teacher version of the TDUS, the analytic sample included 3,572 respondents, which was a 34.5 percent response rate. For the principal version of the survey, the analytic sample included 171 respondents, which was a 48.4 percent response rate.

The study team conducted a nonresponse bias analysis to determine the extent to which respondents differed from the original sample on key characteristics. The original sample included all survey recipients. Means and standard deviations were calculated for each characteristic for the original sample and for the analytic sample. Next, the mean difference between the original sample and the analytic sample for each variable was calculated. This mean difference was divided by the standard deviation for the original sample. According to NCEE (2019) guidance, any differences greater than 0.05 standard deviation should be accounted for in the analyses.

The study team examined a variety of key characteristics that were available in the NDE administrative datasets (table B2). These variables were available for every educator who was included in the original sample. For both the teacher and principal versions of the TDUS, three characteristics of the schools in which the educator worked were examined: school level (elementary, middle, or high), school accountability classification (excellent, great, good, or needs improvement), and Title I status. In addition, for the teacher version four personal characteristics were examined: highest degree earned (lower than a bachelor's, bachelor's, master's, or more-advanced degree); special education endorsement or no special education endorsement; full-time equivalency; years of experience in education; and an indicator as to whether the teacher taught a core subject. For the principal version full-time equivalency was the only personal characteristic examined. Prior to the nonresponse calculations dummy variables were created for all the categorical variables.

Table B2. Key characteristics used for nonresponse bias analyses

Variable name	Description
Highest degree earned	Teachers were divided into four categories based on their highest degree earned: lower than a bachelor's degree (for example, a certificate), bachelor's degree, master's degree, or more-advanced degree (education specialist or doctoral degree).
Special education endorsement	Teachers were divided into two categories based on whether they had a special education endorsement.
Core subject teacher	Teachers were considered to be teaching a core subject if they taught general elementary, English language arts, math, science, or history/social studies. Teachers were considered to be teaching a noncore subject if they taught other subjects such as fine arts, health/physical education, foreign language, intervention, technology, or response to intervention.
Years of experience in education	Teachers' years of experience in education were included as a continuous variable for the nonresponse bias analyses. To aid in interpretation for the analyses to answer the research questions, teachers were divided into four categories: 5 or fewer years, 6–12 years, 13–21 years, or 22 or more years. The categories were established by dividing the data points for years of experience in education into quartiles.
Teacher full-time equivalency	Teachers' full-time equivalency is a ratio of their teaching load compared with a full-time teacher's load. Thus, a 1 would indicate a full-time teaching load.
Principal full-time equivalency	Principals' full-time equivalency is a ratio of their principal administrative load compared with a full-time principal's load. Thus, a 1 would indicate a full-time load.
School level	Schools were divided into three categories based on the grade levels they served (elementary, middle, or high school).
School accountability classifications	By considering multiple indicators of school performance, the Nebraska Department of Education (2018a) classifies each Nebraska school into one of four classification levels: excellent, great, good, and needs improvement. These indicators include statewide math and English language arts assessment scores and trends, graduation rates, student absenteeism rates, and English learner student progress toward proficiency. This classification system is used to strategically target resources and support to schools most in need of improvement.
Title I school	Schools were divided into two categories based on whether they had Title I status. A Title I school receives federal funds under Title I, Part A, of the Every Student Succeeds Act. Title I funds are intended to assist schools with high concentrations of students from low-income households.[a]

a. See https://www2.ed.gov/programs/titleiparta/index.html.
Source: Authors' creation.

The nonresponse bias analyses for teachers indicated that the analytic sample differed from the original sample by more than 0.05 standard deviation for three characteristics (table B3). A smaller proportion of teachers in the analytic sample (41 percent) than in the original sample (44 percent) worked in high schools. A larger proportion of teachers in the analytic sample (24 percent) than in the original sample (21 percent) had a special education endorsement. Finally, on average, teachers in the analytic sample had more experience working in education (14.93 years) than did teachers in the original sample (14.07 years).

Table B3. Comparison of original teacher sample and teacher analytic sample on key characteristics, 2019

Characteristic	Original sample (*n* = 10,349)		Analytic sample (*n* = 3,572)		Difference in standard deviation units
	Mean	Standard deviation	Mean	Standard deviation	
School level					
Elementary	0.28	0.45	0.29	0.45	–0.02
Middle	0.29	0.45	0.31	0.46	–0.04
High	0.44	0.50	0.41	0.49	0.06
School accountability classification					
Needs improvement	0.31	0.46	0.31	0.46	0.00
Good	0.26	0.44	0.26	0.44	–0.01[a]
Great	0.24	0.42	0.23	0.42	0.02
Excellent	0.19	0.40	0.20	0.40	–0.02
Title I school	0.33	0.47	0.35	0.48	–0.03
Teacher's highest degree earned					
Lower than bachelor's degree	0.00	0.05	0.00	0.06	–0.02[a]
Bachelor's degree	0.44	0.50	0.42	0.49	0.04
Master's degree	0.55	0.50	0.57	0.50	–0.04
More-advanced degree[b]	0.01	0.09	0.01	0.09	0.00
Teacher has a special education endorsement	0.21	0.41	0.24	0.43	–0.07
Teacher full-time equivalency	0.91	0.22	0.91	0.22	0.00
Years of experience in education	14.07	10.25	14.93	10.54	–0.08
Teacher teaches a core subject	0.45	0.50	0.46	0.50	–0.02

a. When rounded to two decimal places, the difference between the means for the original sample and analytic sample appeared to be zero. However, the means were not, in fact, identical, resulting in a nonzero value for the difference in standard deviation units.
b. An education specialist or doctoral degree.
Source: Authors' analysis of 2019 administrative data from the Nebraska Department of Education.

The nonresponse bias analyses for principals indicated that the analytic sample differed from the original sample by more than 0.05 standard deviation for just one characteristic: Title I school (table B4). A greater proportion of principals in the analytic sample (38 percent) worked in Title I schools than in the original sample (34 percent).

Table B4. Comparison of original principal sample and principal analytic sample on key characteristics, 2019

Characteristic	Original sample (*n* = 353)		Analytic sample (*n* = 171)		Difference in standard deviation units
	Mean	Standard deviation	Mean	Standard deviation	
School level					
Elementary	0.33	0.47	0.33	0.47	0.01[a]
Middle	0.33	0.47	0.33	0.47	–0.01[a]
High	0.34	0.47	0.34	0.47	0.00
School accountability classification					
Needs improvement	0.25	0.43	0.25	0.43	0.01[a]
Good	0.25	0.44	0.27	0.45	–0.05
Great	0.25	0.43	0.24	0.43	0.02
Excellent	0.25	0.43	0.24	0.43	0.02
Title I school	0.34	0.48	0.38	0.49	–0.08
Principal full-time equivalency	0.83	0.26	0.82	0.26	0.04

a. When rounded to two decimal places, the difference between the means for the original sample and analytic sample appeared to be zero. However, the means were not, in fact, identical, resulting in a nonzero value for the difference in standard deviation units.
Source: Authors' analysis of 2019 administrative data from the Nebraska Department of Education.

Calculation of nonresponse weights

To account for the differences between the original sample and the analytic sample, nonresponse weights were calculated. These weights were subsequently used in the analyses to adjust the analytic sample data so that the data more closely resembled the original sample. The methods used to calculate the weights are described here, first for teachers and then for principals.

Calculation of nonresponse weights for the teacher sample. Logistic regression was used to calculate nonresponse weights for the teacher sample. Using data from all teachers in the original sample, the study team fit a logistic regression model that included a binary indicator of whether a teacher was in the analytic sample as the dependent variable. This variable was coded 1 if the teacher was in the analytic sample and 0 if the teacher was not. The model included the three independent variables for which the difference between the original sample and the analytic sample was greater than 0.05 standard deviation: high school, special education endorsement, and years of experience.

Using the results from the logistic regression, the study team calculated the predicted probability of response for each member of the original sample. The inverse of the predicted probability for each case multiplied by the overall response rate was used as the weight. The means and standard deviations for each of the key variables for the original sample, alongside the weighted means and standard deviations for the analytic sample, are in table B5. This table demonstrates that, once the weights were applied, there were no differences greater than 0.05 standard deviation between the original sample and the analytic sample on key characteristics.

Table B5. Comparison of original teacher sample and weighted teacher analytic sample on key characteristics, 2019

	Original sample (*n* = 10,349)		Analytic sample (*n* = 3,572)		Difference in standard deviation units
Characteristic	Mean	Standard deviation	Mean	Standard deviation	
School level					
Elementary	0.28	0.45	0.27	0.45	0.01
Middle	0.29	0.45	0.29	0.45	–0.01[a]
High	0.44	0.50	0.43	0.50	0.00
School accountability classification					
Needs improvement	0.31	0.46	0.31	0.46	–0.01[a]
Good	0.26	0.44	0.26	0.44	–0.01[a]
Great	0.24	0.42	0.23	0.42	0.03
Excellent	0.19	0.40	0.20	0.40	–0.01
Title I school	0.33	0.47	0.34	0.47	–0.02
Teacher's highest degree earned					
Lower than bachelor's degree	0.00	0.05	0.00	0.06	–0.04[a]
Bachelor's degree	0.44	0.50	0.43	0.50	0.02
Master's degree	0.55	0.50	0.56	0.50	–0.01
More-advanced degree[b]	0.01	0.09	0.01	0.09	0.00
Teacher has a special education endorsement	0.21	0.41	0.22	0.41	0.00
Teacher full-time equivalency	0.91	0.22	0.91	0.22	-0.01[a]
Years of experience in education	14.07	10.25	14.10	10.26	0.00
Teaches a core subject	0.45	0.50	0.47	0.50	-0.04

a. When rounded to two decimal places, the difference between the means for the original sample and analytic sample appeared to be zero. However, the means were not, in fact, identical, resulting in a nonzero value for the difference in standard deviation units.
b. An education specialist or doctoral degree.
Source: Authors' analysis of 2019 administrative data from the Nebraska Department of Education.

Calculation of nonresponse weights for the principal sample. Logistic regression was also used to calculate nonresponse weights for principals. The calculation of weights for principals, however, was not as straightforward. The study team found that weighting to adjust for one variable led the weighted analytic sample to differ from the original sample by more than 0.05 standard deviation on additional variables. An iterative process was followed in which additional logistic regressions were fit, including any new variables with differences greater than 0.05 standard deviation as predictors; new weights were calculated; and nonresponse bias analyses were repeated. The details of this iterative process are described here.

Because the original sample and analytic sample differed by more than 0.05 standard deviation on just one variable, Title I status, this was the only independent variable in the model. Weights were calculated using the procedure previously described for the teacher sample. When the descriptive statistics for the key characteristics for the weighted sample were compared with the original sample, the two samples were similar in terms of Title I status (both 34 percent), but the two samples differed by more than 0.05 standard deviation for elementary school level.

The study team fit a second logistic regression model that included Title I status, elementary school level, and the interaction between them. A second set of weights was calculated using the results of this model, and the weighted descriptive statistics for the key characteristics for the analytic sample were again compared with the original sample. The result was a weighted analytic sample that was similar to the original sample in terms of elementary school level (both 33 percent) and Title I (both 34 percent) but differed from the original sample by more than 0.05 standard deviation on the good accountability classification.

The study team fit a third logistic regression model with the following independent variables: Title I status, elementary school level, and good accountability classification, along with all of the interactions between them. A third set of weights was calculated, which resulted in a weighted analytic sample that was similar to the original sample in terms of Title I status (both 34 percent), elementary school level (both 33 percent), and good accountability classification (both 26 percent). However, this weighted analytic sample differed from the original sample by more than 0.05 standard deviation on principal full-time equivalency.

The study team then fit a fourth logistic regression model that included Title I status, elementary school level, good accountability classification, principal full-time equivalency, and all possible two-way, three-way, and four-way interactions. A fourth and final set of weights was calculated. Once the weights were applied, the analytic sample did not differ from the original sample on any of the key characteristics by more than 0.05 standard deviation (table B6).

Table B6. Comparison of original principal sample and weighted principal analytic sample on key characteristics, 2019

Characteristic	Original sample (n = 353)		Analytic sample (n = 171)		Difference in standard deviation units
	Mean	Standard deviation	Mean	Standard deviation	
School level					
Elementary	0.33	0.47	0.33	0.47	0.00
Middle	0.33	0.47	0.33	0.47	0.01[a]
High	0.34	0.47	0.34	0.48	–0.01[a]
School accountability classification					
Needs improvement	0.25	0.43	0.24	0.43	0.02
Good	0.26	0.44	0.26	0.44	0.00
Great	0.25	0.43	0.25	0.43	–0.01[a]
Excellent	0.25	0.43	0.25	0.44	–0.02[a]
Title I school	0.34	0.48	0.34	0.48	0.00[a]
Principal full-time equivalency	0.83	0.26	0.83	0.26	0.00

a. When rounded to two decimal places, the difference between the means for the original sample and analytic sample appeared to be zero. However, the means were not, in fact, identical, resulting in a nonzero value for the difference in standard deviation units.
Source: Authors' analysis of 2019 administrative data from the Nebraska Department of Education.

Measures

The study team examined Nebraska teachers' and principals' responses to the TDUS (see appendix E). The TDUS allows users to customize the questions to refer to the specific type of assessment data that is most important and relevant in their state or local contexts. NDE uses the Nebraska Student-Centered Assessment System (NSCAS), which identifies three assessment components to measure what students know and need to learn: the NSCAS Summative assessment; the Northwestern Evaluation Association's MAP Growth interim assessment; and formative assessment (table B7). The NSCAS formative assessment component is not part of a centralized data warehouse, nor do teachers enter or access formative data as part of any type of statewide system. NDE customized the TDUS to include questions about five different summative assessments (NSCAS English language arts, NSCAS mathematics, NSCAS science, NSCAS ACT, and English Language Proficiency Assessment for the 21st Century [ELPA21]); the state's interim assessment (MAP Growth); and classroom-based formative assessments.

Table B7. Nebraska Department of Education definitions and Teacher Data Use Survey data category for summative, interim, and formative assessment types

Assessment type	NDE definition	TDUS data category
Summative state assessment	"Culminating assessments measuring student performance against state content area standards" (Nebraska Department of Education, 2018b, p. 2). Nebraska schools administer the NSCAS summative computer-adaptive assessment to measure math and English language arts content standards and college readiness. NDE refers to this assessment as "NSCAS Summative" for grades 3–8 and "NSCAS ACT" for high school.	The TDUS refers to the "state" data category as including state-level tests and student achievement data (Wayman et al., 2016). This study uses the NSCAS Summative assessment to represent the "state" data category. The TDUS measures, rather than prescribes or defines, how teachers should use student data from the state data category.
Interim assessment	"Assessments administered at intervals between instruction (typically fall/winter/spring) to help teachers better understand student learning needs and determine growth toward learning targets" (Nebraska Department of Education, 2018b, p. 2). The NSCAS Interim assessment system consists of MAP Growth, which is available to Nebraska districts at no cost. The assessment measures "what individual students know and are ready to learn and tracks growth toward proficiency levels" (Nebraska Department of Education, 2018b, p. 2).	The TDUS refers to the "periodic" data category as including commercially available assessments administered periodically during the school year (Wayman et al., 2016). This study refers to the NSCAS Interim assessment to represent the "periodic" data category. The TDUS measures, rather than prescribes or defines, how teachers should use student data from the periodic data category.
Formative assessment	"Formal and informal tools teachers use in the classroom to check their students' understanding and then adapt their teaching in the moment to what students need" (Nebraska Department of Education, 2018b, p. 2). NDE refers to this assessment process as "formative."	The TDUS refers to the "local" data category as including, for example, common formative assessments that districts develop. The TDUS also refers to the "personal" data category as including, for example, teacher-developed classroom-based assessments such as tests, quizzes, and homework. Both the local and personal data categories focus on teachers' use of formative student data, which aligns to NDE's reference to formal and informal tools teachers use in the classroom (Wayman et al., 2016). This study refers to formative assessments to represent the "local" and "personal" data categories on the TDUS. The TDUS measures, rather than prescribes or defines, how teachers should use student data from the local and personal data categories.

NDE is Nebraska Department of Education. NSCAS is Nebraska Student-Centered Assessment System. TDUS is Teacher Data Use Survey.
Source: Authors' creation based on definitions in Nebraska Department of Education (2018b) and Wayman et al. (2016).

The teacher and principal versions of the TDUS contain similar content, but the wording of survey items changes to reflect the appropriate respondent roles (teacher or principal). Respondents use a four-point Likert scale to respond to each question. The items on the TDUS measure the frequency with which teachers use NSCAS Summative, NSCAS Interim, and formative assessment data; the actions teachers take with NSCAS Summative, NSCAS Interim, and formative assessment data; perceptions of teachers' competence in using data; teachers' attitudes toward data use; and the organizational supports available to help teachers use data.

To address the research questions, the study team analyzed data from the TDUS. Information about each of the variables, including the survey items that comprise each scale and the reliability estimates for each scale, is in table B8. All of the scales created from survey items had acceptable reliability for both the teacher and principal versions.

Table B8. Teacher Data Use Survey variables analyzed to address the research questions, 2019

Variable	Research question	Survey items[a]	Cronbach's alpha coefficients	
			Teacher version	Principal version
Frequency of use of NSCAS English language arts	1, 2	2a	na[b]	na[b]
Frequency of use of NSCAS mathematics	1, 2	2b	na[b]	na[b]
Frequency of use of NSCAS science	1, 2	2c	na[b]	na[b]
Frequency of use of NSCAS ACT	1, 2	2d	na[b]	na[b]
Frequency of use of ELPA21	1, 2	2e	na[b]	na[b]
Frequency of use of MAP Growth (interim data)	1, 2	2f	na[b]	na[b]
Frequency of use of formative assessments	1, 2	2g	na[b]	na[b]
Usefulness of summative data	1, 2	Mean of 3a–3e	na[c]	na[c]
Usefulness of interim data	1, 2	3f	na[b]	na[b]
Usefulness of formative data	1, 2	3g	na[b]	na[b]
Actions with summative data	1–5	Mean of actions with NSCAS English language arts data (4a–4h), actions with NSCAS mathematics data (5a–5h), NSCAS science data (6a–6h), actions with NSCAS ACT data (7a–7h), and actions with ELPA21 data (8a–8h)	.94	.94
Actions with interim data	1–5	Mean of 9a–9h	.94	.94
Actions with formative data	1–5	Mean of 10a–10h	.92	.92
Competence in using data	3–5	Mean of 15a–15d	.92	.91
Attitudes toward data	3–5	Mean of 12a–12i	.88	.88
Organizational supports	3–5	Mean of 11a–11f, 13a–13f, 14a–14e	.80	.79

na is not applicable.
ELPA21 is English Language Proficiency Assessment for the 21st Century. NSCAS is Nebraska Student-Centered Assessment System.
a. See appendix E for the full text of the teacher and principal versions of the Teacher Data Use Survey.
b. This construct is measured with a single item. Thus, Cronbach's alpha cannot be calculated.
c. The survey included questions about five different types of summative data. Because these summative assessments are administered to students at different grade levels, only a very small percentage of teachers had access to all five types of summative data. Similarly, only a small percentage of principals worked with teachers who had access to all five types of summative data. Thus, it did not make sense to calculate Cronbach's alpha for this scale.
Source: Authors' creation and analysis based on 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Analyses to address research questions

The analytic approach for each of the research questions is described in this section. Due to the large sample size, the analyses for research questions 3–5 had high statistical power to detect small effects that might be of little practical significance. Consequently, discussion of results focused on mean differences between groups that were 0.25 or larger. For consistency, this threshold was also used for determining results to discuss for research questions 1 and 2.

How do Nebraska teachers report using summative, interim, and formative data to inform practice? To address research question 1, the study team calculated descriptive statistics (for example, means, standard deviations, frequencies) of TDUS items related to how often teachers use data to inform their instructional practice. Specifically, these descriptive analyses summarized the frequency with which teachers use summative, interim, and formative assessment data and the actions they take when using each of these assessments to inform practice.

Are Nebraska principals' attitudes about data and perceptions of teachers' data use similar to teachers' reports of their own attitudes and data use? Research question 2 examined the responses across the teacher and principal

versions of the TDUS on all survey scales. The study team calculated scale means and standard deviations, following the TDUS guide (Wayman et al., 2016). The guide suggests that using scale means is appropriate when making comparisons across survey scales (actions with data, perceived data competence, attitudes toward data, and perceived organizational supports for using data) and survey versions (teacher and principal). Additionally, when individual items combine to measure a particular scale (for example, perceived data competence), calculating means and standard deviations are an appropriate method (Boone & Boone, 2012; Sullivan & Artino, 2013). Therefore, the study team calculated and reported means to provide a consistent presentation of results that allows readers to make visual comparisons of differences among variables of interest (for example, data type, respondent type, and TDUS scale).

How does teachers' use of data relate to teachers' perceived competence in using data, attitudes toward data, and perceptions of organizational supports for using data? To address research question 3, the study team fit three multilevel models with each of the following dependent variables: actions with summative data; actions with interim data; and actions with formative data. At level 1, three independent variables were included: competence in using data, organizational supports, and attitudes toward data. In addition, four level-1 covariates were included: teacher's highest degree earned (bachelor's degree, master's degree, or more-advanced degree; dummy coded), an indicator for whether the teacher had a special education endorsement, teacher's years of experience in education (categorized into quartiles: 5 or fewer years, 6–12 years, 13–21 years, or 22 or more years;[4] dummy coded), and an indicator for whether the teacher taught a core subject. All variables included at level 1 were group mean–centered (Enders & Tofighi, 2007; Kreft et al., 1995). At level 2, two covariates were included: school level (elementary, middle, or high; dummy coded) and Title I status. These variables were grand mean–centered.

How do teachers' use of data, perceived competence in using data, attitudes toward data, and perceptions of organizational supports for using data vary by teacher characteristic? The study team fit six models to address research question 4. The models included each of the following dependent variables: actions with summative data, actions with interim data, actions with formative data, competence in using data, attitudes toward data, and organizational supports. In these models teacher characteristics served as the independent variables of interest. Specifically, at level 1 the following variables were added: teacher's highest degree earned (bachelor's degree, master's degree, or more-advanced degree; dummy coded), years in education (categorized into quartiles: 5 or fewer years, 6–12 years, 13–21 years, or 22 or more years; dummy coded), an indicator for whether the teacher had a special education endorsement, and an indicator for whether the teacher taught a core subject. All variables included at level 1 were group mean–centered. At level 2, two covariates were included: school level (elementary, middle, or high; dummy coded) and Title I status. These variables were grand mean–centered.

The study team fit additional models to obtain the coefficients needed to calculate adjusted means for categorical predictors. For each characteristic of interest, a model was fit with the dummy variables for that characteristic uncentered. For example, a model was fit with the dummy variables for education uncentered but all other variables centered. The results of this model were used to calculate adjusted means for education levels. In this model bachelor's degree was the reference category, so the intercept for the model was equal to the adjusted mean for that group. Adjusted means for the other two groups (master's degree and more-advanced degree) were calculated by adding the coefficient for each group's dummy variable to the intercept. This process was repeated for each of the other teacher characteristics: years of experience in education, special education endorsement, and core subject.

How do teachers' use of data, perceived competence in using data, attitudes toward data, and perceptions of organizational supports for using data vary based on Nebraska school accountability classifications (that is, excellent, great, good, and needs improvement) for the 2018/19 school year? To address research question 5, the

[4] The study team categorized years of experience in education into quartiles to make it easier for readers to interpret the results.

study team fit six multilevel models, each with one of the following dependent variables: actions with summative data, actions with interim data, actions with formative data, competence in using data, attitudes toward data, and organizational supports for using data. These models were similar to the models fit to address research question 4. The only difference was the addition of school accountability classification as independent variables (excellent, great, good, or needs improvement; dummy coded) at level 2. As with the other level-2 variables, these dummy variables were grand mean–centered. The study team fit additional models to obtain the coefficients needed to calculate adjusted means for school accountability classifications, using the same process as that for research question 4.

References

Boone, Jr., H. N., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension*, *50*(2), 1–5. https://eric.ed.gov/?id=EJ1042448.

Enders, C. K., & Tofighi, D. (2007). Center predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods*, *12*(2), 121–138. https://eric.ed.gov/?id=EJ766180.

Kreft, I. G. G., de Leeuw, J., & Aiken, L. S. (1995). The effect of different forms of centering in hierarchical linear models. *Multivariate Behavioral Research*, *30*(1), 1–21. https://eric.ed.gov/?id=EJ510997.

National Center for Education Evaluation and Regional Assistance. (2019). *NCEE guidance for REL study proposals, reports, and other products.* U.S. Department of Education, Institute of Education Sciences.

Nebraska Department of Education. (2018a). *Accountability in Nebraska: Classification & designation.* https://aquestt.com/wp-content/uploads/2018/07/ClassificationDesignation.pdf.

Nebraska Department of Education. (2018b). *NSCAS Nebraska Student-Centered Assessment System* (Legislative Policy Brief). https://cdn.education.ne.gov/wp-content/uploads/2018/02/NSCAS-Policy-Brief-FEB18.pdf.

Sullivan, G. M., & Artino, Jr., A. R. (2013). Analyzing and interpreting data from Likert-type scales. *Journal of Graduate Medical Education*, *5*(4), 541–542.

Wayman, J. C., Wilkerson, S. B., Cho, V., Mandinach, E. B., & Supovitz, J. A. (2016). *Guide to using the Teacher Data Use Survey* (REL 2017–166). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Appalachia. https://eric.ed.gov/?id=ED569169.

Appendix C. Supporting analysis

This appendix provides descriptive statistics (for example, numbers of teachers or principals, means, and standard deviations) to support findings in the report for research questions 1 and 2 (tables C1–C9). Supporting hierarchical linear models for research questions 3–5 are also presented (tables C10–C36).

Table C1. Percentage of teachers who did not use summative, interim, or formative data and percentage of principals who perceived that teachers did not use these data types, 2019

	Teachers		Principals	
Data type	Number	Percent	Number	Percent
Did not use data from at least one type of summative assessment[a]	948	29	11	6
Did not use interim[b] data	697	21	0	0
Did not use formative data	187	6	1	1

Note: For this survey item, respondents could select a response option indicating they did not use (or, on the principal version, perceived that teachers did not use) the assessment type. For those who did use the assessment type, respondents could indicate the frequency with which they used, or perceived teachers as using (on the principal version), each assessment type (see table C2).
a. The mean for summative data includes the average across ratings for five different summative assessment types available to Nebraska teachers. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students). See table D2 in appendix D for descriptive results disaggregated by each summative assessment type.
b. Interim assessment is the MAP Growth interim assessment.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C2. Means and standard deviations of teacher self-reported frequency in using summative, interim, and formative data and principals' perceptions of teachers' frequency in using these data types, 2019

	Teachers			Principals		
Data type	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Frequency of using summative data[a]	2,268	1.63	0.80	160	1.54	0.70
Frequency of using interim data[b]	2,643	1.98	0.91	168	2.22	0.78
Frequency of using formative data	3,016	3.03	0.91	163	3.08	0.85

Note: Frequency was measured on a four-point scale in which 1 = less than once a month, 2 = once or twice a month, 3 = weekly or almost weekly, and 4 = a few times a week. Respondents could indicate that they did not use a given assessment. The means include only respondents who indicated frequency of use on the four-point scale and do not include respondents who indicated they did not use the given data type.
a. The mean for summative data includes the average across ratings for five different summative assessment types available to Nebraska teachers. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), and NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students). See table D2 in appendix D for descriptive results disaggregated by each summative assessment type.
b. Interim assessment is the MAP Growth interim assessment.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C3. Means and standard deviations of teachers' and principals' perceptions of usefulness of summative, interim, and formative data, 2019

	Teachers			Principals		
Data type	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Usefulness of summative data[a]	3,216	1.83	0.75	171	2.35	0.75
Usefulness of interim data[b]	3,340	2.61	1.03	168	3.42	0.66
Usefulness of formative data	3,203	3.33	0.86	164	3.59	0.62

Note: Usefulness was measured on a four-point scale in which 1 = not useful, 2 = somewhat useful, 3 = useful, and 4 = very useful.
a. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students). See table D2 in appendix D for descriptive results disaggregated by each summative assessment type.
b. Interim assessment is the MAP Growth Interim assessment.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C4. Means and standard deviations of teachers' self-reported actions with summative, interim, and formative data and principals' perceptions of teachers' actions with these data types, 2019

	Teachers			Principals		
Data type	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Actions with summative data[a]	2,268	1.24	0.38	160	1.24	0.40
Actions with interim data[b]	2,643	1.77	0.72	168	2.05	0.65
Actions formative data	3,016	2.50	0.77	163	2.66	0.67

Note: Frequency of actions with summative data was measured on a scale in which 1 = one or two times a year, 2 = a few times a year, 3 = monthly, and 4 = weekly. Frequency of actions with interim and formative data was measured on a scale in which 1 = less than once a month, 2 = monthly, 3 = weekly, and 4 = a few times a week. To make comparisons using the same scale, ratings for summative data were recoded to the interim and formative response scale. A rating of 4 (weekly) on the summative scale was recoded as a 3 (weekly or almost weekly) on the interim/formative scale, a rating of 3 (monthly) was recoded as a 2 (once or twice a month), and a rating of 2 or 1 was recoded as a 1 (less than once a month).
a. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students).
b. Interim assessment is the MAP Growth Interim assessment.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C5. Item-level means and standard deviations of teachers' self-reported actions with summative, interim, and formative data, 2019

	Actions with summative data[a]			Actions with interim data[b]			Actions with formative data		
Action with data items	Number of teachers	Mean	Standard deviation	Number of teachers	Mean	Standard deviation	Number of teachers	Mean	Standard deviation
To identify instructional content to use in class.	2,268	1.37	0.60	2,643	1.95	0.91	3,016	2.92	0.93
To tailor instruction to individual students' needs.	2,268	1.35	0.58	2,643	2.00	0.93	3,016	2.96	0.92
To develop recommendations for additional instructional support.	2,268	1.31	0.53	2,643	1.99	0.91	3,016	2.88	0.93
To form small groups of students for targeted instruction.	2,268	1.27	0.50	2,643	1.94	0.95	3,016	2.69	1.02
To discuss data with a parent or guardian.	2,268	1.08	0.28	2,643	1.41	0.69	3,016	1.89	0.96
To discuss data with a student.	2,268	1.20	0.44	2,643	1.56	0.77	3,016	2.62	0.96
To meet with a specialist (e.g., instructional coach or data coach) about data.	2,268	1.13	0.35	2,643	1.53	0.76	3,016	1.76	0.95
To meet with another teacher about data.	2,268	1.24	0.47	2,643	1.75	0.84	3,016	2.31	1.00

Note: Frequency of actions with summative data was measured on a scale in which 1 = one or two times a year, 2 = a few times a year, 3 = monthly, and 4 = weekly. Frequency of actions with interim and formative data was measured on a scale in which 1 = less than once a month, 2 = monthly, 3 = weekly, and 4 = a few times a week. To make comparisons using the same scale, ratings for summative data were recoded to the interim and formative response scale. A rating of 4 (weekly) on the summative scale was recoded as a 3 (weekly or almost weekly) on the interim/formative scale, a rating of 3 (monthly) was recoded as a 2 (once or twice a month), and a rating of 2 or 1 was recoded as a 1 (less than once a month). See table D6 in appendix D for descriptive results for summative data without recoding.
a. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students).
b. Interim assessment is the MAP Growth interim assessment.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C6. Means and standard deviations of teachers' and principals' perceptions of teachers' competence in using data, attitudes toward data, and perceptions of organizational supports, 2019

	Teachers			Principals		
Scale	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Competence in Using Data	3,572	2.91	0.56	171	2.86	0.50
Attitudes toward Data	3,572	3.09	0.51	171	3.43	0.44
Organizational Supports	3,572	2.95	0.51	171	3.11	0.45

Note: Scale items were measured on a four-point scale in which 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree.
Source: Authors' analyses based on 2019 data from Nebraska Department of Education's Teacher Data Use Survey data.

Table C7. Item-level means and standard deviations of teachers' and principals' attitudes toward data, 2019

	Teachers			Principals			
Subscale and item	Number	Mean	Standard deviation	Number	Mean	Standard deviation	Mean difference
Data's Effectiveness for Pedagogy subscale							
Data help teachers plan instruction.	3,572	3.19	0.57	171	3.48	0.55	–0.29
Data offer information about students that was not already known.	3,568	3.02	0.60	170	3.22	0.58	–0.19
Data help teachers know what concepts students are learning.	3,568	3.13	0.55	171	3.36	0.54	–0.23
Data help teachers identify learning goals for students.	3,571	3.17	0.56	171	3.38	0.51	–0.22
Students benefit when teacher instruction is informed by data.	3,567	3.15	0.59	171	3.56	0.50	–0.40
Attitudes toward Data subscale							
I think it is important to use data to inform education practice.	3,567	3.15	0.58	171	3.50	0.52	–0.35
I like to use data.	3,571	2.93	0.71	171	3.39	0.59	–0.46
I find data useful.	3,569	3.09	0.62	171	3.47	0.51	–0.38
Using data helps me be a better [teacher/educator].	3,570	3.07	0.66	171	3.51	0.54	–0.44

Note: Scale items were measured on a four-point scale in which 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. Brackets indicate where survey wording differed between the teacher and principal versions.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C8. Item-level means and standard deviations of teachers' and principals' perceptions of organizational supports for using data, 2019

Subscale and item	Teachers			Principals			Mean difference
	Number	Mean	Standard deviation	Number	Mean	Standard deviation	
Support for Data Use subscale							
[I am/My teachers are] adequately supported in the effective use of data.	3,570	2.93	0.66	171	2.98	0.55	–0.05
[I am/My teachers are] adequately prepared to use data.	3,571	2.89	0.67	171	2.87	0.59	0.01
There is someone who answers my [my teachers'] questions about using data.	3,571	3.03	0.69	171	3.19	0.61	–0.16
There is someone who helps [my/my teachers'] change [my/their] practice (e.g., my/their teaching) based on data.	3,570	2.75	0.75	171	2.93	0.61	–0.18
My district [provides/provides my teachers] enough professional development about data use.	3,567	2.84	0.78	171	2.78	0.73	0.06
My district's [professional development/professional development for my teachers] is useful for learning about data use.	3,567	2.76	0.77	171	2.86	0.66	–0.09
Principal Leadership subscale							
[My principal or assistant principal(s) encourages/I encourage] data use as a tool to support effective teaching.	3,570	3.20	0.63	170	3.42	0.52	–0.22
[My principal or assistant principal(s) creates/I create] many opportunities for teachers to use data.	3,570	2.93	0.74	171	3.09	0.66	–0.16
[My principal or assistant principal(s) has/I have] made sure teachers have plenty of training for data use.	3,571	2.82	0.77	171	2.84	0.74	–0.02
[My principal or assistant principal(s) is/I am] a good example of an effective data user.	3,565	2.98	0.76	171	3.04	0.67	–0.05
[My principal or assistant principal(s) discusses/I discuss] data with [me/my teachers].	3,571	2.88	0.76	171	3.28	0.55	–0.39
[My principal or assistant principal(s) creates/I create] protected time for using data.	3,567	2.70	0.84	171	2.96	0.72	–0.26
Computer Data Systems subscale							
I have the proper technology to efficiently examine data.	3,571	3.16	0.61	171	3.42	0.53	–0.26
The computer systems in my district provide me access to lots of data.	3,569	3.12	0.63	170	3.41	0.58	–0.29
The computer systems (for data use) in my district are easy to use.	3,566	3.01	0.69	171	3.22	0.66	–0.21
The computer systems in my district allow me to examine various types of data at once (e.g., attendance, achievement, demographics).	3,569	3.03	0.68	171	3.20	0.73	–0.17
The computer systems in my district generate displays (e.g., reports, graphs, tables) that are useful to me.	3,565	3.01	0.68	171	3.15	0.72	–0.14

Note: Scale items were measured on a four-point scale in which 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. Brackets indicate where survey wording differed between the teacher and principal versions.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C9. Item-level means and standard deviations of teachers' perceived competence in using data and principals' perceptions of teacher competence in using data, 2019

	Teachers			Principals			
Scale item	Number	Mean	Standard deviation	Number	Mean	Standard deviation	Mean difference
[I am/My teachers are] good at using data to diagnose student learning needs.	3,570	2.92	0.61	171	2.90	0.57	0.02
[I am/My teachers are] good at adjusting instruction based on data.	3,572	2.96	0.60	171	2.88	0.56	0.09
[I am/My teachers are] good at using data to plan lessons.	3,572	2.87	0.63	171	2.81	0.57	0.05
[I am/My teachers are] good at using data to set student learning goals.	3,568	2.91	0.63	171	2.84	0.59	0.07

Note: Scale items were measured on a four-point scale in which 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. Brackets indicate where survey wording differed between the teacher and principal versions.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C10. Complete results for the hierarchical linear model examining the association between teachers' perceived competence in using data, attitudes toward data, and perceptions of organizational supports for using data, and their actions with summative data, 2019

Variable	Coefficient	Standard error
Intercept	1.73***	0.02
Competence in using data	0.19***	0.04
Attitudes toward data	0.06	0.04
Organizational supports for using data	0.20***	0.04
School level[a]		
Middle school	–0.07	0.04
High school	–0.17***	0.04
Title I school	0.05	0.04
Teacher's highest degree earned[b]		
Master's degree	–0.02	0.03
More-advanced degree	–0.22	0.15
Teacher has special education endorsement	–0.02	0.04
Teacher teaches core subject	0.21***	0.04
Years of experience in education[c]		
5 or fewer years	0.02	0.04
6–12 years	0.05	0.04
13–21 years	–0.01	0.04

*** Significant at $p < .001$.
Note: n = 2,277 teachers in 348 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model competence with data, attitudes toward data, organizational supports, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.
a. Elementary school was the reference category for school level.
b. Bachelor's degree was the reference category for teacher's highest degree earned.
c. 22 or more years was the reference category for years of experience in education.
Source: Authors' analysis of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C11. Complete results for the hierarchical linear model examining the association between teachers' perceived competence in using data, attitudes toward data, and perceptions of organizational supports for using data, and their actions with interim data, 2019

Variable	Coefficient	Standard error
Intercept	1.78***	0.02
Competence in using data	0.23***	0.03
Attitudes toward data	0.08	0.04
Organizational supports for using data	0.22***	0.03
School level[a]		
Middle school	–0.22***	0.05
High school	–0.46***	0.05
Title I school	0.01	0.04
Teacher's highest degree earned[b]		
Master's degree	0.02	0.03
More-advanced degree	–0.13	0.18
Teacher has special education endorsement	0.04	0.03
Teacher teaches core subject	0.16***	0.03
Years of experience in education[c]		
5 or fewer years	0.16***	0.04
6–12 years	0.09	0.04
13–21 years	0.04	0.04

*** Significant at $p < .001$.

Note: n = 2,665 teachers in 350 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model competence with data, attitudes toward data, organizational supports, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C12. Complete results for the hierarchical linear model examining the association between teachers' perceived competence in using data, attitudes toward data, and perceptions of organizational supports for using data, and their actions with formative data, 2019

Variable	Coefficient	Standard error
Intercept	2.46***	0.02
Competence in using data	0.30***	0.03
Attitudes toward data	0.13***	0.03
Organizational supports for using data	0.14***	0.03
School level[a]		
Middle school	–0.21***	0.05
High school	–0.33***	0.05
Title I school	–0.07	0.05
Teacher's highest degree earned[b]		
Master's degree	0.02	0.03
More-advanced degree	–0.17	0.15
Teacher has special education endorsement	–0.08	0.03
Teacher teaches core subject	0.25***	0.03
Years of experience in education[c]		
5 or fewer years	0.30***	0.04
6–12 years	0.22***	0.04
13–21 years	0.06	0.04

*** Significant at $p < .001$.

Note: n = 3,013 teachers in 351 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model competence with data, attitudes toward data, organizational supports, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C13. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their perceived competence in using data, 2019

Variable	Coefficient	Standard error
Intercept	2.92***	0.01
School level[a]		
Middle school	–0.26***	0.03
High school	–0.27***	0.03
Title I school	–0.01	0.03
Teacher's highest degree earned[b]		
Master's degree	0.08***	0.02
More-advanced degree	0.27	0.11
Teacher has special education endorsement	0.13***	0.02
Teacher teaches core subject	–0.01	0.02
Years of experience in education[c]		
5 or fewer years	0.05	0.03
6–12 years	0.05	0.03
13–21 years	0.01	0.03

*** Significant at $p < .001$.

Note: n = 3,572 teachers in 353 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C14. Predicted means for the hierarchical linear model examining the association between teachers' characteristics and their perceived competence in using data, 2019

Characteristic	Predicted mean
Teacher's highest degree earned	
Bachelor's degree[a]	2.88
Master's degree	2.96
More-advanced degree	3.17
Teacher has special education endorsement	
No	2.89
Yes	3.03
Teacher teaches core subject	
No	2.93
Yes	2.92
Years of experience in education	
5 or fewer years	2.96
6–12 years	2.96
13–21 years	2.90
22 or more years[b]	2.87

Note: n = 3,572 teachers in 353 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean.

a. Bachelor's degree was the reference category for teacher's highest degree earned.

b. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C15. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their attitudes toward data, 2019

Variable	Coefficient	Standard error
Intercept	3.10***	0.01
School level[a]		
Middle school	–0.24***	0.03
High school	–0.23***	0.03
Title I school	0.00	0.03
Teacher's highest degree earned[b]		
Master's degree	0.06**	0.02
More-advanced degree	0.26	0.10
Teacher has special education endorsement	0.12***	0.02
Teacher teaches core subject	0.04	0.02
Years of experience in education[c]		
5 or fewer years	0.14***	0.03
6–12 years	0.07**	0.02
13–21 years	0.00	0.02

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: n = 3,572 teachers in 353 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C16. Predicted means for the hierarchical linear model examining the association between teachers' characteristics and their attitudes toward data, 2019

Characteristic	Predicted mean
Teacher's highest degree earned	
Bachelor's degree[a]	3.07
Master's degree	3.13
More-advanced degree	3.36
Teacher has special education endorsement	
No	3.07
Yes	3.20
Teacher teaches core subject	
No	3.09
Yes	3.12
Years of experience in education	
5 or fewer years	3.21
6–12 years	3.13
13–21 years	3.05
22 or more years[b]	3.04

Note: n = 3,572 teachers in 353 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean.

a. Bachelor's degree was the reference category for teacher's highest degree earned.

b. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C17. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their perceptions of organizational supports for using data, 2019

Variable	Coefficient	Standard error
Intercept	2.97***	0.01
School level[a]		
Middle school	–0.19***	0.04
High school	–0.25***	0.04
Title I school	–0.05	0.03
Teacher's highest degree earned[b]		
Master's degree	0.01	0.02
More-advanced degree	–0.01	0.10
Teacher has special education endorsement	0.04	0.02
Teacher teaches core subject	–0.06**	0.02
Years of experience in education[c]		
5 or fewer years	–0.01	0.03
6–12 years	–0.03	0.02
13–21 years	–0.03	0.02

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: n = 3,572 teachers in 353 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C18. Predicted means for the hierarchical linear model examining the association between teachers' characteristics and their perceptions of organizational supports for using data, 2019

Characteristic	Predicted mean
Teacher's highest degree earned	
Bachelor's degree[a]	2.96
Master's degree	2.97
More-advanced degree	2.96
Teacher has special education endorsement	
No	2.96
Yes	3.00
Teacher teaches core subject	
No	2.99
Yes	2.94
Years of experience in education	
5 or fewer years	2.98
6–12 years	2.96
13–21 years	2.96
22 or more years[b]	2.97

Note: n = 3,572 teachers in 353 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean.

a. Bachelor's degree was the reference category for teacher's highest degree earned.

b. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C19. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their self-reported actions with summative data, 2019

Variable	Coefficient	Standard error
Intercept	1.73***	0.02
School level[a]		
Middle school	–0.07	0.04
High school	–0.17***	0.04
Title I school	0.04	0.04
Teacher's highest degree earned[b]		
Master's degree	0.00	0.03
More-advanced degree	–0.14	0.16
Teacher has special education endorsement	0.01	0.04
Teacher teaches core subject	0.18***	0.04
Years of experience in education[c]		
5 or fewer years	0.04	0.05
6–12 years	0.07	0.04
13–21 years	–0.01	0.04

*** Significant at $p < .001$.

Note: n = 2,277 teachers in 348 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C20. Predicted means for the hierarchical linear model examining the association between teachers' characteristics and their self-reported actions with summative data, 2019

Characteristic	Predicted mean
Teacher's highest degree earned	
Bachelor's degree[a]	1.73
Master's degree	1.73
More-advanced degree	1.57
Teacher has special education endorsement	
No	1.73
Yes	1.72
Teacher teaches core subject	
No	1.64
Yes	1.81
Years of experience in education	
5 or fewer years	1.75
6–12 years	1.78
13–21 years	1.68
22 or more years[b]	1.70

Note: n = 2,277 teachers in 348 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean.

a. Bachelor's degree was the reference category for teacher's highest degree earned.

b. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C21. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their self-reported actions with interim data, 2019

Variable	Coefficient	Standard error
Intercept	1.78***	0.02
School level[a]		
Middle school	–0.23***	0.05
High school	–0.46***	0.05
Title I school	0.01	0.04
Teacher's highest degree earned[b]		
Master's degree	0.05	0.03
More-advanced degree	–0.08	0.18
Teacher has special education endorsement	0.08	0.03
Teacher teaches core subject	0.12***	0.04
Years of experience in education[c]		
5 or fewer years	0.18***	0.04
6–12 years	0.10	0.04
13–21 years	0.04	0.04

*** Significant at $p < .001$.

Note: n = 2,665 teachers in 350 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C22. Predicted means for the hierarchical linear model examining the association between teachers' characteristics and their self-reported actions with interim data, 2019

Characteristic	Predicted mean
Teacher's highest degree earned	
Bachelor's degree[a]	1.75
Master's degree	1.80
More-advanced degree	1.72
Teacher has special education endorsement	
No	1.76
Yes	1.83
Teacher teaches core subject	
No	1.72
Yes	1.83
Years of experience in education	
5 or fewer years	1.88
6–12 years	1.81
13–21 years	1.73
22 or more years[b]	1.70

Note: n = 2,665 teachers in 350 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean.

a. Bachelor's degree was the reference category for teacher's highest degree earned.

b. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C23. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their self-reported actions with formative data, 2019

Variable	Coefficient	Standard error
Intercept	2.46***	0.02
School level[a]		
Middle school	–0.20***	0.05
High school	–0.32***	0.05
Title I school	–0.07	0.05
Teacher's highest degree earned[b]		
Master's degree	0.05	0.03
More-advanced degree	–0.06	0.16
Teacher has special education endorsement	–0.02	0.03
Teacher teaches core subject	0.23***	0.03
Years of experience in education[c]		
5 or fewer years	0.33***	0.04
6–12 years	0.24**	0.04
13–21 years	0.06	0.04

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: n = 3,013 teachers in 351 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C24. Predicted means for the hierarchical linear model examining the association between teachers' characteristics and their self-reported actions with formative data, 2019

Characteristic	Predicted mean
Teacher's highest degree earned	
Bachelor's degree[a]	2.41
Master's degree	2.50
More-advanced degree	2.47
Teacher has special education endorsement	
No	2.46
Yes	2.45
Teacher teaches core subject	
No	2.37
Yes	2.56
Years of experience in education	
5 or fewer years	2.65
6–12 years	2.56
13–21 years	2.37
22 or more years[b]	2.28

Note: n = 3,013 teachers in 351 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean.

a. Bachelor's degree was the reference category for teacher's highest degree earned.

b. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C25. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' perceived competence in using data, 2019

Variable	Coefficient	Standard error
Intercept	2.92***	0.01
School accountability classification[a]		
Good	0.00	0.03
Great	0.03	0.04
Excellent	0.01	0.04
School level[b]		
Middle school	–0.25***	0.03
High school	–0.27***	0.03
Title I school	0.00	0.03
Teacher's highest degree earned[c]		
Master's degree	0.08***	0.02
More-advanced degree	0.27	0.11
Teacher has special education endorsement	0.13***	0.02
Teacher teaches core subject	–0.01	0.02
Years of experience in education[d]		
5 or fewer years	0.05	0.03
6–12 years	0.05	0.03
13–21 years	0.01	0.03

*** Significant at $p < .001$.

Note: n = 3,572 teachers in 353 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, excellent, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

b. Elementary school was the reference category for school level.

c. Bachelor's degree was the reference category for teacher's highest degree earned.

d. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C26. Predicted means for the hierarchical linear model examining the association between school accountability classifications and teachers' perceived competence in using data, 2019

School accountability classification	Predicted mean
Needs Improvement[a]	2.91
Good	2.91
Great	2.94
Excellent	2.93

Note: n = 3,572 teachers in 353 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, and excellent were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C27. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' attitudes toward data, 2019

Variable	Coefficient	Standard error
Intercept	3.10***	0.01
School accountability classification[a]		
Good	–0.01	0.03
Great	–0.01	0.03
Excellent	0.00	0.03
School level[b]		
Middle school	–0.24***	0.03
High school	–0.23***	0.03
Title I school	0.00	0.03
Teacher's highest degree earned[c]		
Master's degree	0.06**	0.02
More-advanced degree	0.26	0.10
Teacher has special education endorsement	0.12***	0.02
Teacher teaches core subject	0.04	0.02
Years of experience in education[d]		
5 or fewer years	0.14***	0.03
6–12 years	0.07**	0.02
13–21 years	0.00	0.02

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: n = 3,572 teachers in 353 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, excellent, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

b. Elementary school was the reference category for school level.

c. Bachelor's degree was the reference category for teacher's highest degree earned.

d. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C28. Predicted means for the hierarchical linear model examining the association between school accountability classifications and teachers' attitudes toward data, 2019

School accountability classification	Predicted mean
Needs Improvement[a]	3.11
Good	3.10
Great	3.10
Excellent	3.11

Note: n = 3,572 teachers in 353 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, and excellent were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C29. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' perceptions of organizational supports for using data, 2019

Variable	Coefficient	Standard error
Intercept	2.97***	0.01
School accountability classification[a]		
Good	0.05	0.04
Great	0.10**	0.04
Excellent	0.09	0.04
School level[b]		
Middle school	–0.17***	0.04
High school	–0.24***	0.04
Title I school	–0.02	0.03
Teacher's highest degree earned[c]		
Master's degree	0.01	0.02
More-advanced degree	–0.01	0.10
Teacher has special education endorsement	0.04	0.02
Teacher teaches core subject	–0.06**	0.02
Years of experience in education[d]		
5 or fewer years	–0.01	0.03
6–12 years	–0.03	0.02
13–21 years	–0.03	0.02

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: n = 3,572 teachers in 353 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, excellent, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

b. Elementary school was the reference category for school level.

c. Bachelor's degree was the reference category for teacher's highest degree earned.

d. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C30. Predicted means for the hierarchical linear model examining the association between school accountability classifications and teachers' perceptions of organizational supports for using data, 2019

School accountability classification	Predicted mean
Needs Improvement[a]	2.91
Good	2.96
Great	3.01
Excellent	3.00

Note: n = 3,572 teachers in 353 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, and excellent were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C31. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' self-reported actions with summative data, 2019

Variable	Coefficient	Standard error
Intercept	1.73**	0.02
School accountability classification[a]		
Good	–0.04	0.04
Great	0.00	0.04
Excellent	0.03	0.05
School level[b]		
Middle school	–0.06	0.04
High school	–0.16***	0.04
Title I school	0.05	0.04
Teacher's highest degree earned[c]		
Master's degree	0.00	0.03
More-advanced degree	–0.14	0.16
Teacher has special education endorsement	0.01	0.04
Teacher teaches core subject	0.18***	0.04
Years of experience in education[d]		
5 or fewer years	0.04	0.05
6–12 years	0.07	0.04
13–21 years	–0.01	0.04

*** Significant at $p < .001$.

Note: n = 2,277 teachers in 348 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, excellent, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

a. Elementary school was the reference category for school level.

b. Bachelor's degree was the reference category for teacher's highest degree earned.

c. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C32. Predicted means for the hierarchical linear model examining the association between school accountability classifications and teachers' self-reported actions with summative data, 2019

School accountability classification	Predicted mean
Needs Improvement[a]	1.73
Good	1.69
Great	1.73
Excellent	1.76

Note: n = 2,277 teachers in 348 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, and excellent were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C33. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' self-reported actions with interim data, 2019

Variable	Coefficient	Standard error
Intercept	1.77***	0.02
School accountability classification[a]		
Good	–0.06	0.05
Great	–0.11	0.05
Excellent	–0.11	0.05
School level[b]		
Middle school	–0.24***	0.04
High school	–0.48***	0.05
Title I school	–0.03	0.04
Teacher's highest degree earned[c]		
Master's degree	0.05	0.03
More-advanced degree	–0.08	0.18
Teacher has special education endorsement	0.08	0.03
Teacher teaches core subject	0.12***	0.04
Years of experience in education[d]		
5 or fewer years	0.18***	0.04
6–12 years	0.10	0.04
13–21 years	0.04	0.04

*** Significant at $p < .001$.

Note: n = 2,665 teachers in 350 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, excellent, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

b. Elementary school was the reference category for school level.

c. Bachelor's degree was the reference category for teacher's highest degree earned.

d. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C34. Predicted means for the hierarchical linear model examining the association between school accountability classifications and teachers' self-reported actions with interim data, 2019

School accountability classification	Predicted mean
Needs Improvement[a]	1.84
Good	1.78
Great	1.73
Excellent	1.74

Note: *n* = 2,665 teachers in 350 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, and excellent were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C35. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' self-reported actions with formative data, 2019

Variable	Coefficient	Standard error
Intercept	2.46***	0.02
School accountability classification[a]		
Good	–0.07	0.05
Great	–0.08	0.06
Excellent	–0.14	0.06
School level[b]		
Middle school	–0.22***	0.05
High school	–0.35***	0.05
Title I school	–0.11	0.05
Teacher's highest degree earned[c]		
Master's degree	0.05	0.03
More-advanced degree	–0.06	0.16
Teacher has special education endorsement	–0.02	0.03
Teacher teaches core subject	0.23***	0.03
Years of experience in education[d]		
5 or fewer years	0.33***	0.04
6–12 years	0.24**	0.04
13–21 years	0.06	0.04

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: n = 3,013 teachers in 351 schools. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, excellent, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

b. Elementary school was the reference category for school level.

c. Bachelor's degree was the reference category for teacher's highest degree earned.

d. 22 or more years was the reference category for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C36. Predicted means for the hierarchical linear model examining the association between school accountability classifications and teachers' self-reported actions with formative data, 2019

School accountability classification	Predicted mean
Needs improvement[a]	2.53
Good	2.47
Great	2.45
Excellent	2.39

Note: n = 3,013 teachers in 351 schools. Predicted means are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 or fewer years of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Good, great, and excellent were all centered around the mean for the whole sample.

a. Needs improvement was the reference category for school accountability classification.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Appendix D. Other analyses

This appendix presents analyses of Teacher Data Use Survey data from teachers and principals that are not presented in the report. These data include results about availability of summative, interim, and formative data to teachers (survey question 1; table D1); teachers' and principals' ratings of the various types of summative assessments used in Nebraska (tables D2–D4); and item-level means for the teacher and principal surveys (tables D5–D6).

Table D1. Percentage of teachers who reported having summative, interim, and formative data available to them and percentage of principals who perceived teachers having these data types available to them, 2019

	Teachers		Principals	
Data type	Number	Percentage	Number	Percentage
At least one type of summative assessment data available[a]	3,216	90	171	100
Interim data available[b]	3,340	93	168	98
Formative data available	3,203	90	164	96

a. The mean for summative data includes the average across ratings for five different summative assessment types available to Nebraska teachers. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students).
b. Interim assessment is the MAP Growth interim assessment
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table D2. Percentage of teachers who did not use data and percentage of principals who perceived that teachers did not use data by summative assessment type, 2019

	Teachers		Principals	
Summative assessment type	Number	Percentage	Number	Percentage
Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8)	1,357	45	13	8
NSCAS mathematics (grades 3–8)	1,497	50	13	8
NSCAS science (grades 5 and 8)	1,685	59	15	9
NSCAS ACT (grade 11)	1,079	49	14	12
English Language Proficiency Assessment for the 21st Century (English learner students)	1,147	59	10	10

Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table D3. Means and standard deviations of teachers' frequency in using data and principals' perceptions of teachers' frequency in using data by summative assessment type, 2019

	Teachers			Principals		
Summative assessment type	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8)	1,630	1.63	0.87	153	1.60	0.80
NSCAS mathematics (grades 3–8)	1,484	1.71	0.92	153	1.61	0.79
NSCAS science (grades 5 and 8)	1,195	1.61	0.84	149	1.56	0.80
NSCAS ACT (grade 11)	1,110	1.62	0.83	98	1.52	0.74
English Language Proficiency Assessment for the 21st Century (English learner students)	809	1.62	0.85	91	1.48	0.73

Note: Frequency was measured on a four-point scale in which 1 = less than once a month, 2 = once or twice a month, 3 = weekly or almost weekly, and 4 = a few times a week. Respondents had the opportunity to indicate that they did not use a given assessment. The means include only respondents who indicated frequency of use on the four-point scale and does not include respondents who indicated that they did not use the given data type.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table D4. Means and standard deviations of teachers' and principals' perceptions of usefulness of data by summative assessment type, 2019

	Teachers			Principals		
Summative assessment type	Number	Mean	Standard deviation	Number	Mean	Standard deviation
Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8)	2,987	1.88	0.89	166	2.39	0.84
NSCAS mathematics (grades 3–8)	2,981	1.83	0.93	166	2.37	0.83
NSCAS science (grades 5 and 8)	2,880	1.70	0.88	164	2.36	0.82
NSCAS ACT (grade 11)	2,189	1.85	0.92	112	2.41	0.78
English Language Proficiency Assessment for the 21st Century (English learner students)	1,956	1.85	0.93	101	2.30	0.79

Note: Usefulness was measured on a four-point scale in which 1 = not useful, 2 = somewhat useful, 3 = useful, and 4 = very useful.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table D5. Item-level means and standard deviations of principals' perceptions of teachers' actions with summative, interim, and formative data, 2019

	Actions with summative data[a]			Actions with interim data[b]			Actions with formative data		
Action with data items	Number of principals	Mean	Standard deviation	Number of principals	Mean	Standard deviation	Number of principals	Mean	Standard deviation
To identify instructional content to use in class.	160	1.29	0.53	168	2.24	0.79	163	3.04	0.76
To tailor instruction to individual students' needs.	160	1.33	0.58	168	2.33	0.83	163	3.00	0.79
To develop recommendations for additional instructional support.	160	1.31	0.55	168	2.33	0.80	163	2.98	0.79
To form small groups of students for targeted instruction.	160	1.28	0.51	168	2.27	0.78	163	2.93	0.81
To discuss data with a parent or guardian.	160	1.08	0.27	168	1.55	0.70	163	1.99	0.91
To discuss data with a student.	160	1.25	0.47	168	1.88	0.79	163	2.74	0.81
To meet with a specialist (e.g., instructional coach or data coach) about data.	160	1.15	0.35	168	1.76	0.79	163	2.05	0.92
To meet with another teacher about data.	160	1.26	0.46	168	2.07	0.80	163	2.54	0.90

Note: Frequency of actions with summative data was measured on a scale in which 1 = one or two times a year, 2 = a few times a year, 3 = monthly, and 4 = weekly. Frequency of actions with interim and formative data was measured on a scale in which 1 = less than once a month, 2 = monthly, 3 = weekly, and 4 = a few times a week. To make comparisons using the same scale, ratings for summative data were recoded to the interim and formative response scale. A rating of 4 (weekly) on the summative scale was recoded as a 3 (weekly or almost weekly) on the interim/formative scale, a rating of 3 (monthly) was recoded as a 2 (once or twice a month), and a rating of 2 or 1 was recoded as a 1 (less than once a month).
a. The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students).
b. Interim assessment is the MAP Growth Interim assessment.
Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table D6. Item-level means and standard deviations of teachers' self-reported actions with summative data comparing the original survey response scale and recoded response scale, 2019

	Original response scale[a]			Recoded response scale[b]		
Action with data items	Number of teachers	Mean	Standard deviation	Number of teachers	Mean	Standard deviation
To identify instructional content to use in class.	2,268	1.93	0.90	2,268	1.37	0.60
To tailor instruction to individual students' needs.	2,268	1.89	0.88	2,268	1.35	0.58
To develop recommendations for additional instructional support.	2,268	1.85	0.83	2,268	1.31	0.53
To form small groups of students for targeted instruction.	2,268	1.75	0.82	2,268	1.27	0.50
To discuss data with a parent or guardian.	2,268	1.43	0.58	2,268	1.08	0.28
To discuss data with a student.	2,268	1.64	0.75	2,268	1.20	0.44
To meet with a specialist (e.g., instructional coach or data coach) about data.	2,268	1.48	0.67	2,268	1.13	0.35
To meet with another teacher about data.	2,268	1.76	0.78	2,268	1.24	0.47

Note: The summative assessments are Nebraska Student-Centered Assessment System (NSCAS) English language arts (grades 3–8), NSCAS mathematics (grades 3–8), NSCAS science (grades 5 and 8), NSCAS ACT (grade 11), and the English Language Proficiency Assessment for the 21st Century (English learner students).

a. Frequency of actions with summative data were measured on a scale in which 1 = one or two times a year, 2 = a few times a year, 3 = monthly, and 4 = weekly.

b. Ratings for summative data were recoded to the interim and formative response scale. A rating of 4 (weekly) on the summative scale was recoded as a 3 (weekly or almost weekly) on the interim/formative scale, a rating of 3 (monthly) was recoded as a 2 (once or twice a month), and a rating of 2 or 1 was recoded as a 1 (less than once a month).

Source: Authors' analyses of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Appendix E. Teacher and principal versions of the Teacher Data Use Survey

The following appendix includes the teacher and principal versions of the Teacher Data Use Survey.

Teacher Data Use Survey *[Teacher Version]*

Welcome! The purpose of the Teacher Data Use Survey is to learn about how teachers use data for educational improvement in your district. Administering the Teacher Data Use Survey can provide many benefits to district and school leaders as well as teachers. Some of the benefits include:

A comprehensive perspective on how teachers use data, their attitudes toward data, and the supports that help them use data.

An evidence base from which to plan ongoing support, such as professional development, computer data systems, and collaborative structures for data use.

A triangulated assessment of how administrator and instructional support staff view teacher data use.

The Teacher Data Use Survey takes about 15–20 minutes to complete. Your responses will remain confidential, and reports will only use aggregated results.

As a teacher, we value your input and trust that the information you provide will be vital to the success of this survey. Please continue to the next page to start the survey.

The Teacher Data Use Survey is prepared by Jeffrey C. *Wayman, Vincent Cho, Ellen B. Mandinach, Jonathan A. Supovitz, and Stephanie B. Wilkerson for the Institute of Education Sciences (JES) under Contract ED-JES-12-C-0005 by Regional Educational Laboratory Appalachia administered by CNA.*

---

1. Are the following forms of data available to you at **[School]?**

		Yes	No
a.	NSCAS-English Language Arts	( )	( )
b.	NSCAS-Mathematics	( )	( )
c.	NSCAS-Science	( )	( )
d.	NSCAS-ACT	( )	( )
e.	ELPA21	( )	( )
f.	MAP Growth (NWEA)	( )	( )
g.	Formative Assessments	( )	( )
h.	Perceptual Data *(i.e., perceptions of learning environment)*	( )	( )
i.	Other (please specify):	( )	( )

If you indicated “no” to all options in question 1, skip to question 11. If you responded ‘yes’ to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How frequently do you use the following forms of data?

		Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a.	NSCAS-English Language Arts	( )	( )	( )	( )	( )
b.	NSCAS-Mathematics	( )	( )	( )	( )	( )
c.	NSCAS-Science	( )	( )	( )	( )	( )
d.	NSCAS-ACT	( )	( )	( )	( )	( )
e.	ELPA21	( )	( )	( )	( )	( )
f.	MAP Growth (NWEA)	( )	( )	( )	( )	( )
g.	Formative Assessments	( )	( )	( )	( )	( )
h.	Perceptual Data *(i.e., perceptions of learning environment)*	( )	( )	( )	( )	( )
i.	Other:	( )	( )	( )	( )	( )

3. Now, how useful are the following forms of data to your practice?

		Not useful	Somewhat useful	Useful	Very useful
a.	NSCAS-English Language Arts	( )	( )	( )	( )
b.	NSCAS-Mathematics	( )	( )	( )	( )
c.	NSCAS-Science	( )	( )	( )	( )
d.	NSCAS-ACT	( )	( )	( )	( )
e.	ELPA21	( )	( )	( )	( )
f.	MAP Growth (NWEA)	( )	( )	( )	( )
g.	Formative Assessments	( )	( )	( )	( )
h.	Perceptual Data (i.e., perceptions of learning environment)	( )	( )	( )	( )
i.	Other:	( )	( )	( )	( )

If you indicated that NSCAS-English Language Arts is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-English Language Arts in question 2, please go to question 5.

4. These questions ask about NSCAS-English Language Arts. In a typical school year, how often do you do the following?

		One or two times a year	A few times a year	Monthly	Weekly
a.	Use NSCAS-English Language Arts to identify instructional content to use in class.	( )	( )	( )	( )
b.	Use NSCAS-English Language Arts to tailor instruction to individual students' needs.	( )	( )	( )	( )
c.	Use NSCAS-English Language Arts to develop recommendations for additional instructional support.	( )	( )	( )	( )
d.	Use NSCAS-English Language Arts to form small groups of students for targeted instruction.	( )	( )	( )	( )
e.	Discuss NSCAS-English Language Arts with a parent or guardian.	( )	( )	( )	( )
f.	Discuss NSCAS-English Language Arts with a student.	( )	( )	( )	( )
g.	Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-English Language Arts.	( )	( )	( )	( )
h.	Meet with another teacher about NSCAS- English Language Arts.	( )	( )	( )	( )

If you indicated that NSCAS-Mathematics is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-Mathematics in question 2, please go to question 6.

5. These questions ask about NSCAS-Mathematics. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Mathematics to identify instructional content to use in class.	( )	( )	( )	( )
b. Use NSCAS-Mathematics to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use NSCAS-Mathematics to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use NSCAS-Mathematics to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss NSCAS-Mathematics with a parent or guardian.	( )	( )	( )	( )
f. Discuss NSCAS-Mathematics with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.q., instructional coach or data coach) about NSCAS-Mathematics.	( )	( )	( )	( )
h. Meet with another teacher about NSCAS- Mathematics.	( )	( )	( )	( )

If you indicated that NSCAS-Science is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-Science in question 2, please go to question 7.

6. These questions ask about NSCAS-Science. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Science to identify instructional content to use in class.	( )	( )	( )	( )
b. Use NSCAS-Science to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use NSCAS-Science to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use NSCAS-Science to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss NSCAS-Science with a parent or guardian.	( )	( )	( )	( )
f. Discuss NSCAS-Science with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-Science.	( )	( )	( )	( )
h. Meet with another teacher about NSCAS- Science.	( )	( )	( )	( )

If you indicated that NSCAS-ACT is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-ACT in question 2, please go to question 8.

7. These questions ask about NSCAS-ACT. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-ACT to identify instructional content to use in class.	( )	( )	( )	( )
b. Use NSCAS-ACT to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use NSCAS-ACT to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use NSCAS-ACT to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss NSCAS-ACT with a parent or guardian.	( )	( )	( )	( )
f. Discuss NSCAS-ACT with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-ACT.	( )	( )	( )	( )
h. Meet with another teacher about NSCAS-ACT.	( )	( )	( )	( )

If you indicated that ELPA21 is "not available" to you in question 1, OR if you indicated that you "do not use" ELPA21 in question 2, please go to question 9.

8. These questions ask about ELPA21. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use ELPA21 to identify instructional content to use in class.	( )	( )	( )	( )
b. Use ELPA21 to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use ELPA21 to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use ELPA21 to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss ELPA21 with a parent or guardian.	( )	( )	( )	( )
f. Discuss ELPA21 with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about ELPA21.	( )	( )	( )	( )
h. Meet with another teacher about ELPA21.	( )	( )	( )	( )

If you indicated that MAP Growth (NWEA) is "not available" to you in question 1, OR if you indicated that you "do not use" MAP Growth (NWEA) in question 2, please go to question 10.

9. These questions ask about MAP Growth (NWEA) used in your school or district. In a typical month, how often do you do the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use MAP Growth (NWEA) to identify instructional content to use in class.	( )	( )	( )	( )
b. Use MAP Growth (NWEA) to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use MAP Growth (NWEA) to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use MAP Growth (NWEA) to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss MAP Growth (NWEA) with a parent or guardian.	( )	( )	( )	( )
f. Discuss MAP Growth (NWEA) with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about MAP Growth (NWEA).	( )	( )	( )	( )
h. Meet with another teacher about MAP Growth (NWEA).	( )	( )	( )	( )

If you indicated that Formative Assessments are "not available" to you in question 1, OR if you indicated that you "do not use" Formative Assessments in question 2, please go to question 11.

10. These questions ask about Formative Assessments developed and used in your school or district. In a typical month, how often do you do the following?

		Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a.	Use Formative Assessments to identify instructional content to use in class.	( )	( )	( )	( )
b.	Use Formative Assessments to tailor instruction to individual students' needs.	( )	( )	( )	( )
c.	Use Formative Assessments to develop recommendations for additional instructional support.	( )	( )	( )	( )
d.	Use Formative Assessments to form small groups of students for targeted instruction.	( )	( )	( )	( )
e.	Discuss Formative Assessments with a parent or guardian.	( )	( )	( )	( )
f.	Discuss Formative Assessments with a student.	( )	( )	( )	( )
g.	Meet with a specialist (e.g., instructional coach or data coach) about Formative Assessments.	( )	( )	( )	( )
h.	Meet with another teacher about Formative Assessments .	( )	( )	( )	( )

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about "data":

NSCAS-English Language Arts
NSCAS-Mathematics
NSCAS-Science
NSCAS-ACT
ELPA21
MAP Growth (NWEA)
Formative assessments

11. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

		Strongly disagree	Disagree	Agree	Strongly agree
a.	I am adequately supported in the effective use of data.	( )	( )	( )	( )
b.	I am adequately prepared to use the data.	( )	( )	( )	( )
c.	There is someone who answers my questions about using data.	( )	( )	( )	( )
d.	There is someone who helps me change my practice (e.g., my teaching) based on data.	( )	( )	( )	( )
e.	My district provides enough professional development about data use.	( )	( )	( )	( )
f.	My district's professional development is useful for learning about data use.	( )	( )	( )	( )

12. These questions ask about <u>your</u> attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. Data help teachers plan instruction.	( )	( )	( )	( )
b. Data offer information about students that was not already known.	( )	( )	( )	( )
c. Data help teachers know what concepts students are learning.	( )	( )	( )	( )
d. Data help teachers identify learning goals for students.	( )	( )	( )	( )
e. Students benefit when teacher instruction is informed by data.	( )	( )	( )	( )
f. I think it is important to use data to inform education practice.	( )	( )	( )	( )
g. I like to use data.	( )	( )	( )	( )
h. I find data useful.	( )	( )	( )	( )
i. Using data helps me be a better teacher.	( )	( )	( )	( )

13. These questions ask how your principal and assistant principal(s) support you in using data. Principals and assistant principals will not be able to see your answers. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. My principal or assistant principal(s) encourages data use as a tool to support effective teaching.	( )	( )	( )	( )
b. My principal or assistant principal(s) creates many opportunities for teachers to use data.	( )	( )	( )	( )
c. My principal or assistant principal(s) has made sure teachers have plenty of training for data use.	( )	( )	( )	( )
d. My principal or assistant principal(s) is a good example of an effective data user.	( )	( )	( )	( )
e. My principal or assistant principal(s) discusses data with me.	( )	( )	( )	( )
f. My principal or assistant principal(s) creates protected time for using data.	( )	( )	( )	( )

14. Your school or district gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. I have the proper technology to efficiently examine data.	( )	( )	( )	( )
b. The computer systems in my district provide me access to lots of data.	( )	( )	( )	( )
c. The computer systems (for data use) in my district are easy to use.	( )	( )	( )	( )
d. The computer systems in my district allow me to examine various types of data at once (e.g., attendance, achievement, demographics).	( )	( )	( )	( )
e. The computer systems in my district generate displays (e.g., reports, graphs, tables) that are useful to me.	( )	( )	( )	( )

15. These questions ask about your attitudes towards your own use of data. Please indicate how much you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
a. I am good at using data to diagnose student learning needs.	( )	( )	( )	( )
b. I am good at adjusting instruction based on data.	( )	( )	( )	( )
c. I am good at using data to plan lessons.	( )	( )	( )	( )
d. I am good at using data to set student learning goals.	( )	( )	( )	( )

16. Please select the grade(s) to which you are assigned at THIS school: **[School]**
Please check all that apply. If you do not teach specific grades, please select the last option "None of the above".
    - Prekindergarten
    - Kindergarten
    - 1st Grade
    - 2nd Grade
    - 3rd Grade
    - 4th Grade
    - 5thGrade
    - 6thGrade
    - 7th Grade
    - 8th Grade
    - 9th Grade
    - 10th Grade
    - 11th Grade
    - 12th Grade
    - None of the above

17. Please specify the number of years you have been TEACHING.

18. What else would you like to share with us about data use?

For more information about this survey, please contact: NDE.Research@nebraska.gov

Teacher Data Use Survey *[Principal Version]*

Welcome! The purpose of the Teacher Data Use Survey is to learn about how teachers use data for educational improvement in your district. Administering the Teacher Data Use Survey can provide many benefits to district and school leaders as well as teachers. Some of the benefits include:

A comprehensive perspective on how teachers use data, their attitudes toward data, and the supports that help them use data.

An evidence base from which to plan ongoing support, such as professional development, computer data systems, and collaborative structures for data use.

A triangulated assessment of how administrator and instructional support staff view teacher data use.

The Teacher Data Use Survey takes about 15–20 minutes to complete. Your responses will remain confidential, and reports will only use aggregated results .

As a principal, we value your input and trust that the information you provide will be vital to the success of this survey. Please continue to the next page to start the survey.

The Teacher Data Use Survey is prepared by Jeffrey C. *Wayman, Vincent Cho, Ellen B. Mandinach, Jonathan A. Supovitz, and Stephanie B. Wilkerson for the Institute of Education Sciences (JES) under Contract ED-JES-12-C-0005 by Regional Educational Laboratory Appalachia administered by CNA.*

---

1. Are the following forms of data <u>available</u> to your teachers at [school]?

		Yes	No
a.	NSCAS-English Language Arts	( )	( )
b.	NSCAS-Mathematics	( )	( )
c.	NSCAS-Science	( )	( )
d.	NSCAS-ACT	( )	( )
e.	ELPA21	( )	( )
f.	MAP Growth (NWEA)	( )	( )
g.	Formative Assessments	( )	( )
h.	Perceptual Data (i.e., perceptions of learning environment)	( )	( )
i.	Other (please specify):	( )	( )

If you indicated “no” to all options in question 1, skip to question 11. If you responded ‘yes’ to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How frequently do your teachers use the following forms of data?

		Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a.	NSCAS-English Language Arts	( )	( )	( )	( )	( )
b.	NSCAS-Mathematics	( )	( )	( )	( )	( )
c.	NSCAS-Science	( )	( )	( )	( )	( )
d.	NSCAS-ACT	( )	( )	( )	( )	( )
e.	ELPA21	( )	( )	( )	( )	( )
f.	MAP Growth (NWEA)	( )	( )	( )	( )	( )
g.	Formative Assessments	( )	( )	( )	( )	( )
h.	Perceptual Data (i.e., perceptions of learning environment)	( )	( )	( )	( )	( )
i.	Other:	( )	( )	( )	( )	( )

3. Now, how useful are the following forms of data to teachers' practice?

		Not useful	Somewhat useful	Useful	Very useful
a.	NSCAS-English Language Arts	( )	( )	( )	( )
b.	NSCAS-Mathematics	( )	( )	( )	( )
c.	NSCAS-Science	( )	( )	( )	( )
d.	NSCAS-ACT	( )	( )	( )	( )
e.	ELPA21	( )	( )	( )	( )
f.	MAP Growth (NWEA)	( )	( )	( )	( )
g.	Formative Assessments	( )	( )	( )	( )
h.	Perceptual Data (i.e., perceptions of learning environment)	( )	( )	( )	( )
i.	Other:	( )	( )	( )	( )

If you indicated that NSCAS-English Language Arts is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-English Language Arts in question 2, please go to question 5.

4. These questions ask about NSCAS-English Language Arts. In a typical school year, how often do your teachers do the following?

		One or two times a year	A few times a year	Monthly	Weekly
a.	Use NSCAS-English Language Arts to identify instructional content to use in class.	( )	( )	( )	( )
b.	Use NSCAS-English Language Arts to tailor instruction to individual students' needs.	( )	( )	( )	( )
c.	Use NSCAS-English Language Arts to develop recommendations for additional instructional support.	( )	( )	( )	( )
d.	Use NSCAS-English Language Arts to form small groups of students for targeted instruction.	( )	( )	( )	( )
e.	Discuss NSCAS-English Language Arts with a parent or guardian.	( )	( )	( )	( )
f.	Discuss NSCAS-English Language Arts with a student.	( )	( )	( )	( )
g.	Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-English Language Arts.	( )	( )	( )	( )
h.	Meet with another teacher about NSCAS- English Language Arts.	( )	( )	( )	( )

If you indicated that NSCAS-Mathematics is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-Mathematics in question 2, please go to question 6.

5. These questions ask about NSCAS-Mathematics. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Mathematics to identify instructional content to use in class.	( )	( )	( )	( )
b. Use NSCAS-Mathematics to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use NSCAS-Mathematics to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use NSCAS-Mathematics to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss NSCAS-Mathematics with a parent or guardian.	( )	( )	( )	( )
f. Discuss NSCAS-Mathematics with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.q., instructional coach or data coach) about NSCAS-Mathematics.	( )	( )	( )	( )
h. Meet with another teacher about NSCAS- Mathematics.	( )	( )	( )	( )

If you indicated that NSCAS-Science is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-Science in question 2, please go to question 7.

6. These questions ask about NSCAS-Science. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Science to identify instructional content to use in class.	( )	( )	( )	( )
b. Use NSCAS-Science to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use NSCAS-Science to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use NSCAS-Science to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss NSCAS-Science with a parent or guardian.	( )	( )	( )	( )
f. Discuss NSCAS-Science with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-Science.	( )	( )	( )	( )
h. Meet with another teacher about NSCAS- Science.	( )	( )	( )	( )

If you indicated that NSCAS-ACT is "not available" to you in question 1, OR if you indicated that you "do not use" NSCAS-ACT in question 2, please go to question 8.

7. These questions ask about NSCAS-ACT. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-ACT to identify instructional content to use in class.	( )	( )	( )	( )
b. Use NSCAS-ACT to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use NSCAS-ACT to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use NSCAS-ACT to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss NSCAS-ACT with a parent or guardian.	( )	( )	( )	( )
f. Discuss NSCAS-ACT with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-ACT.	( )	( )	( )	( )
h. Meet with another teacher about NSCAS-ACT.	( )	( )	( )	( )

If you indicated that ELPA21 is "not available" to you in question 1, OR if you indicated that you "do not use" ELPA21 in question 2, please go to question 9.

8. These questions ask about ELPA21. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use ELPA21 to identify instructional content to use in class.	( )	( )	( )	( )
b. Use ELPA21 to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use ELPA21 to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use ELPA21 to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss ELPA21 with a parent or guardian.	( )	( )	( )	( )
f. Discuss ELPA21 with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about ELPA21.	( )	( )	( )	( )
h. Meet with another teacher about ELPA21.	( )	( )	( )	( )

If you indicated that MAP Growth (NWEA) is "not available" to you in question 1, OR if you indicated that you "do not use" MAP Growth (NWEA) in question 2, please go to question 10.

9. These questions ask about MAP Growth (NWEA) used in your school or district. In a typical month, how often do your teachers do the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use MAP Growth (NWEA) to identify instructional content to use in class.	( )	( )	( )	( )
b. Use MAP Growth (NWEA) to tailor instruction to individual students' needs.	( )	( )	( )	( )
c. Use MAP Growth (NWEA) to develop recommendations for additional instructional support.	( )	( )	( )	( )
d. Use MAP Growth (NWEA) to form small groups of students for targeted instruction.	( )	( )	( )	( )
e. Discuss MAP Growth (NWEA) with a parent or guardian.	( )	( )	( )	( )
f. Discuss MAP Growth (NWEA) with a student.	( )	( )	( )	( )
g. Meet with a specialist (e.g., instructional coach or data coach) about MAP Growth (NWEA).	( )	( )	( )	( )
h. Meet with another teacher about MAP Growth (NWEA).	( )	( )	( )	( )

If you indicated that Formative Assessments are "not available" to you in question 1, OR if you indicated that you "do not use" Formative Assessments in question 2, please go to question 11.

10. These questions ask about Formative Assessments developed and used in your school or district. In a typical month, how often do your teachers do the following?

		Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a.	Use Formative Assessments to identify instructional content to use in class.	( )	( )	( )	( )
b.	Use Formative Assessments to tailor instruction to individual students' needs.	( )	( )	( )	( )
c.	Use Formative Assessments to develop recommendations for additional instructional support.	( )	( )	( )	( )
d.	Use Formative Assessments to form small groups of students for targeted instruction.	( )	( )	( )	( )
e.	Discuss Formative Assessments with a parent or guardian.	( )	( )	( )	( )
f.	Discuss Formative Assessments with a student.	( )	( )	( )	( )
g.	Meet with a specialist (e.g., instructional coach or data coach) about Formative Assessments.	( )	( )	( )	( )
h.	Meet with another teacher about Formative Assessments.	( )	( )	( )	( )

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about "data":

NSCAS-English Language Arts
NSCAS-Mathematics
NSCAS-Science
NSCAS-ACT
ELPA21
MAP Growth (NWEA)
Formative assessments

11. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

		Strongly disagree	Disagree	Agree	Strongly agree
a.	My teachers are adequately supported in the effective use of data.	( )	( )	( )	( )
b.	My teachers are adequately prepared to use the data.	( )	( )	( )	( )
c.	There is someone who answers my teachers' questions about using data.	( )	( )	( )	( )
d.	There is someone who helps my teachers change their practice (e.g., their teaching) based on data.	( )	( )	( )	( )
e.	My district provides my teachers enough professional development about data use.	( )	( )	( )	( )
f.	My district's professional development for my teachers is useful for learning about data use.	( )	( )	( )	( )

12. These questions ask about <u>your</u> attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

		Strongly disagree	Disagree	Agree	Strongly agree
a.	Data help teachers plan instruction.	( )	( )	( )	( )
b.	Data offer information about students that was not already known.	( )	( )	( )	( )
c.	Data help teachers know what concepts students are learning.	( )	( )	( )	( )
d.	Data help teachers identify learning goals for students.	( )	( )	( )	( )
e.	Students benefit when teacher instruction is informed by data.	( )	( )	( )	( )
f.	I think it is important to use data to inform education practice.	( )	( )	( )	( )
g.	I like to use data.	( )	( )	( )	( )
h.	I find data useful.	( )	( )	( )	( )
i.	Using data helps me be a better educator.	( )	( )	( )	( )

13. These questions ask about teacher supports for using data. Please indicate how much you agree or disagree with the following statements:

		Strongly disagree	Disagree	Agree	Strongly agree
a.	I encourage data use as a tool to support effective teaching.	( )	( )	( )	( )
b.	I create many opportunities for teachers to use data.	( )	( )	( )	( )
c.	I have made sure teachers have plenty of training for data use.	( )	( )	( )	( )
d.	I am a good example of an effective data user.	( )	( )	( )	( )
e.	I discuss data with my teachers.	( )	( )	( )	( )
f.	I create protected time for using data.	( )	( )	( )	( )

14. Your school or district gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

		Strongly disagree	Disagree	Agree	Strongly agree
a.	I have the proper technology to efficiently examine data.	( )	( )	( )	( )
b.	The computer systems in my district provide me access to lots of data.	( )	( )	( )	( )
c.	The computer systems (for data use) in my district are easy to use.	( )	( )	( )	( )
d.	The computer systems in my district allow me to examine various types of data at once (e.g., attendance, achievement, demographics).	( )	( )	( )	( )
e.	The computer systems in my district generate displays (e.g., reports, graphs, tables) that are useful to me.	( )	( )	( )	( )

15. These questions ask about your attitudes towards <u>your teachers'</u> use of data. Please indicate how much you agree or disagree with the following statements:

		Strongly disagree	Disagree	Agree	Strongly agree
a.	My teachers are good at using data to diagnose student learning needs.	( )	( )	( )	( )
b.	My teachers are good at adjusting instruction based on data.	( )	( )	( )	( )
c.	My teachers are good at using data to plan lessons.	( )	( )	( )	( )
d.	My teachers are good at using data to set student learning goals.	( )	( )	( )	( )

16. What else would you like to share with us about data use?

For more information about this survey, please contact: NDE.Research@nebraska.gov